DRAFT FOR PUBLIC REVIEW

Amendment to the Workplan and Analysis of Brownfields Cleanup Alternatives for the Bayhorse Townsite

Challis, Idaho

Prepared for:

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and

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List of Acronyms and Abbreviations

<	Less than
≥	Equal to or greater than
AAI	All Appropriate Inquiry
ABCA	Analysis of Brownfield Cleanup Alternatives
ATV	All Terrain Vehicle
CFR	Code of Federal Regulations
CIP	Community Involvement Plan
COC	Contaminant of Concern
CY	Cubic Yards
ESA	Environmental Site Assessment
GPS	Global Positioning System
HI	Hazard Index
ICP	Institutional Controls Program
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDPR	Idaho Department of Parks and Recreation
kg	Kilogram
L	Liter
LF	Linear Feet
mg	Milligram
mg/kg	Milligram per Kilogram
QAPP	Quality Assurance Project Plan
RATL	Risk Assessment Target Levels
XRF	X-ray Fluorescence
SF	Square Feet
SY	Square Yard
TDL	Target Distance Limit
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
VCP	Voluntary Cleanup Program

EXECUTIVE SUMMARY

This report presents an amendment to the *Final Workplan and Analysis of Brownfields Cleanup Alternatives for the Bayhorse Townsite* (TerraGraphics 2007a) to include the Pacific and Beardsley-Excelsior Mines (or "Upper Mines") near Challis, Idaho. The purpose of this Amendment is to identify and evaluate cleanup alternatives that will reduce risks to human health and the environment associated with contamination at the Upper Mines.

In 2007, Idaho Department of Parks and Recreation (IDPR) was awarded two U.S. Environmental Protection Agency (USEPA) Brownfields Cleanup Grants to perform cleanup activities in support of the conversion of the Pacific and Beardsley-Excelsior Mines into part of a larger State Historic Recreation Park. IDPR purchased the Pacific and Beardsley-Excelsior Mines in June 2006 for the purpose of converting the abandoned mines (in conjunction with the Bayhorse Townsite) into an historic, cultural, and adventure recreation Park. The Pacific and Beardsley-Excelsior Mines are currently unsuitable for public use due to soil contamination from historic mining and milling activities.

The Pacific and Beardsley-Excelsior Mines are located in the Bayhorse Mining District a few miles from the historic Bayhorse Townsite (or "the Townsite"), which is currently being developed under a 2006 Brownfields Cleanup Grant as part of a larger State Park (Figure 1.1 shows the site location).

The overall cleanup goal for the Upper Mines is to reduce risks to both human health and the environment by preventing direct human contact with contaminated soils and reducing the potential for metals to migrate into nearby surface waters. The *Addendum to Bayhorse Site Risk Assessment and Proposed Risk Management Plan: Upper Mines Risk Management Plan* (Upper Mines Risk Management Plan) (TerraGraphics 2006a) describes specific cleanup elements necessary to ensure a safe environment for Park visitors and workers and proposes the cleanup of select areas and the use of access controls to reduce the overall exposure concentration at the Upper Mines to less than 500 milligrams per kilogram (mg/kg) lead and 50 mg/kg arsenic (TerraGraphics 2006a).

IDPR and the Idaho Department of Environmental Quality (IDEQ) worked jointly to develop a site development plan for the Upper Mines that accommodates IDPR's requirements for a State Park, is consistent with the site development plan for the Townsite, and preserves the characteristics and history of the Upper Mines while reducing the potential for visitors to come in contact with environmental and physical hazards at the site. The cleanup and redevelopment of the Townsite and Upper Mines is the first phase of IDPR's plan to construct a larger State Park. The Park will include the Townsite and some remote upper mine sites (including the Pacific and Beardsley-Excelsior Mines) located in the Bayhorse Mining District. The Townsite will double as a trailhead, primarily for All Terrain Vehicle (ATV) users to access the Upper Mines and back country trails that eventually connect with the Yankee Fork area, the towns of Custer and Bonanza, and other trailheads. This site development plan for the Townsite is

described in detail in the *Final Workplan and Analysis of Brownfields Cleanup Alternatives for the Bayhorse Townsite* (TerraGraphics 2007a).

The site development plan was extended to include the Upper Mines in the Upper Mines Risk Management Plan and development of specific areas described in the plan is summarized briefly below. Figure 2.1 shows the Upper Mines Trail development plan. Figures 2.2 through 2.5 show pre-cleanup soil concentrations. Figures 2.6 through 2.8 show the key elements of IDPR's Upper Mines site development plan.

The Upper Mines Trail System (hereinafter also referred to as the "Trail") will utilize a series of existing trails and roads located within the Bayhorse Mining District, and on U.S. Bureau of Land Management and U.S. Forest Service property (Figure 2.1). Lead and arsenic concentrations in soil samples collected from the Trail were at or below acceptable soil levels and, as a result, do not require cleanup. Soil concentrations for the Trail are shown in Figure 2.5. ATV and other vehicles will not drive through the town site to access the upper mine trail system. An exit trail at the southwest corner of the Slag Pile parking area will allow trail users to access the Trail without passing through the Townsite. The Trail will be engineered to encourage users to stop and rest at clean oases. Amenities such as benches, picnic tables, scenic viewpoints, interpretive signage, hiking trail access points, and ATV parking and turn-around areas will be provided at selected key points on the Trail. These key trail areas are described below.

The Beardsley-Excelsior Mine is located approximately one mile to the northeast of the Townsite. The Trail passes between two structures of significant historical interest at this mine; a mine adit and an elevated trestle. The Beardsley-Excelsior Mine upper landing is accessible by foot about 100 feet north of this point in the trail. As discussed in Section 2, some waste rock and soil samples collected at the Beardsley-Excelsior Mine upper landing and in material under the elevated trestle bed show elevated lead concentrations. Figure 2.2 shows the location of mine structures and pre-cleanup soil concentrations at the Beardsley-Excelsior Mine.

An ATV turn-around with interpretive signs and benches will be constructed north of the mine adit to encourage trail users to stop and access the upper landing, where they can view existing mine structures, on foot. Extensive fencing and signage will be used to keep visitors from accessing areas where physical and environmental hazards exist. Controls to curtail erosion of tailings from the trestle bed into Beardsley Gulch creek will be constructed. Figure 2.6 shows proposed access controls and post-cleanup soil concentrations at the Beardsley-Excelsior Mine.

The Pacific Mine will be a key stopping point on the Upper Mines Trail. An interpretive area with benches, signs and an ATV turn-around will be constructed using clean material at the entrance to the Pacific Mine. The Pacific Mine will be accessible by foot from this point in the Trail. Because elevated lead concentrations were found near the Pacific Bunkhouse and in waste rock and soil collected from several locations, an interpretive walking trail will be constructed using clean material. Figure 2.3 shows the pre-cleanup soil concentrations at the Pacific Mine. Fencing and signage will be used to

keep visitors from accessing areas where physical and environmental hazards exist. Figure 2.7 shows proposed access controls and post-cleanup soil concentrations at the Pacific Mine.

The Lower Pacific Mine consists of two landings located down slope and to the north of the Pacific Mine. There are two buildings, an outhouse, an open adit, and a tailings dump located at the upper most landing. There are two large adits and a large tailings pile at the lower landing. These two landings are included in the Upper Mines Risk Management Plan as a part of the Pacific Mine, as they are easily accessible by trail users and have interesting features sufficient to attract visitors to stop and explore the area. Figure 2.4 shows the pre-cleanup soil concentrations and Figure 2.8 shows proposed access controls and post-cleanup soil concentrations at the Lower Pacific Mine.

Two cleanup alternatives are proposed to achieve cleanup goals at the Beardsley-Excelsior and Pacific Mines. The main differences between Alternative 1 and Alternative 2 are summarized in the Table below.

Alternative 1	*Alternative 2*
Cleanup of Roads and Development of Walking Trails	
Excavate and cap with 12" of clean material in all public areas with soil concentrations equal to or greater than 1,200 mg/kg lead.	Cap trails with a cellular confinement system and 12" of clean material in all areas with soil concentrations equal to or greater than 1,200 mg/kg lead.
ATV Turn-around and Parking Area Development	
Excavate and cap with 12" of clean material in all public areas with soil concentrations equal to or greater than 1,200 mg/kg lead.	Cap trails with a cellular confinement system and 12" of clean material in all areas with soil concentrations equal to or greater than 1,200 mg/kg lead.
Disposal of Contaminated Soil	
Utilize the Slag Pile repository at the Townsite for disposal of contaminated soils excavated from the Upper Mines.	No repository would be required.
Erosion of the Trestle Tailings Pile	
Utilize vegetation, logs and soil wraps with imported fill to stabilize tailings pile.	Utilize native rock to stabilize tailings pile.
Cleanup of Solid and Hazardous Waste	
No difference.	No difference.
Access Restrictions	
Utilize chain-link fencing.	Utilize historic log fencing.
Monitoring and Maintenance of the Remedy	
No difference.	No difference.

The first alternative (Alternative 1) includes the removal of all soils ≥1,200 mg/kg lead from Public Access Areas, Trails, and Turn-around/Parking Areas. Clean ATV turn-around and parking areas would be developed at the Beardsley-Excelsior and Pacific Mines by excavating and capping with clean material areas with soil concentrations ≥1,200 mg/kg lead. The excavated soils would be disposed of in the Slag Pile repository which would be capped with asphalt. Erosion of the Trestle Tailings Pile at the Beardsley-Excelsior Mine caused by seasonal runoff in Beardsley Gulch will be controlled using vegetation, logs and soil wraps with imported fill material to stabilize tailings near the creek bed. Chain-link fencing, natural barriers and signage would be used to restrict the public from accessing areas where contamination and/or physical hazards exist.

The second alternative (Alternative 2) includes the capping of all soils ≥1,200 mg/kg lead in Public Access Areas, Trails, and Turn-around/Parking Areas. Public access areas (i.e., interpretive trails, maintenance roads) would be constructed at both Mines by capping these areas with a cellular confinement system, a soil stabilization system designed to reduce erosion and down slope migration of clean material, and 12-inches of clean material. Clean ATV turn-around and parking areas would be developed at both Mines in the same manner. This alternative does not require excavation and disposal of contaminated soils. Beardsley Gulch erosion of the trestle tailings pile will be controlled using native rock to stabilize tailings near the creek bed. Historic log fencing, natural barriers and signage would be used to restrict the public from accessing areas where contamination and/or physical hazards exist

A No-Action Alternative must be considered as part of the comparative analysis process and assumes no remedial action will be taken at the Upper Mines.

Both Alternative 1 and Alternative 2 would adequately reduce the health risks to Park visitors and staff by isolating contaminated soil at the Upper Mines from direct human contact. Both alternatives would substantially reduce, and potentially eliminate, significant migration of tailings from the trestle ballast to Beardsley Gulch and would satisfy identified environmental protection requirements. In contrast, a No-Action Alternative would not satisfy requirements for adequate protection of human health or the environment as significant lead contamination would still be available for direct human contact and migration.

Both alternatives would adequately protect human health and the environment. Although Alternative 2 is the preferred alternative because aspects of the cleanup are more effective in the long term, more sustainable, easier to implement, and better meet the Park's use and design needs. In addition, this alternative is less costly to implement because it requires no excavation, hauling or disposal of contaminated material. The No-Action Alternative is feasible, but would not be compatible with the land use goals for the Upper Mines.

SECTION 1.0 INTRODUCTION

The Idaho Department of Parks and Recreation (IDPR) engaged TerraGraphics Environmental Engineering, Inc. (TerraGraphics) to develop a Cleanup Workplan and Analysis of Brownfields Cleanup Alternatives (ABCA) for the Bayhorse Townsite (or "the Townsite"), which was finalized in October 2007 and documented in the reported titled *Final Workplan and Analysis of Brownfields Cleanup Alternatives for the Bayhorse Townsite* (hereinafter also referred to as "the Final Workplan") (TerraGraphics 2007a). In December 2007, IDPR proposed to expand cleanup activities at the Townsite to include the Pacific and Beardsley-Excelsior Mines (hereinafter also referred to as the "Upper Mines"). This document amends the Final Workplan to include cleanup at the Upper Mines and address those additions to the Final Workplan that are specific to the Upper Mines. This amendment is completed as part of the Idaho Department of Environmental Quality (IDEQ) Voluntary Cleanup Program (VCP) and in accordance with the United States Environmental Protection Agency (USEPA) Brownfields Cleanup and Redevelopment Program Grant awarded to IDPR.

1.1 Purpose

In June 2006, IDPR purchased the Bayhorse Townsite and Upper Mines from a private party for the purpose of converting the Townsite "ghost town" and associated abandoned mines into an historic, cultural, and adventure recreation Park. Figure 1.1 shows the site location. In 2006, IDPR was awarded a USEPA Brownfields Cleanup Grant to perform cleanup activities in support of the conversion of the Townsite into part of a larger State Park and in 2007, was awarded two additional Brownfields Cleanup Grants to perform cleanup activities at the Upper Mines. The Townsite and the Upper Mines are currently unsuitable for public use due to soil contamination from historic mining and milling activities.

As required by the USEPA, IDPR has entered into the IDEQ VCP. IDEQ will provide regulatory oversight to ensure that cleanup activities are performed in accordance with Idaho State regulations. This Amendment has been prepared in accordance with the Idaho Administrative Procedures Act Idaho Land Remediation Rules (IDAPA 58.01.18) and evaluates and identifies cleanup alternatives for the Upper Mines, consistent with the Park redevelopment plan, that will reduce risks to human health and the environment that are associated with mining-contaminated soils at the Upper Mines.

1.2 Scope

The scope of this report includes the identification, evaluation, and selection of cleanup and management options for mining-contaminated soils at the Upper Mines. Specific tasks include:

- Review of previous reports and investigations;
- establishment of cleanup goals and objectives;
- development of cleanup alternatives in accordance with the cleanup goals;

- description of criteria used to compare cleanup alternatives;
- selection of a preferred alternative and subsequent cleanup plan; and
- development of a statement of work (including a timeline and cost estimate) for the preferred cleanup alternative.

1.3 Report Structure

Section 1 Introduction provides an overview and brief description of the purpose and scope of the amendment.

Section 2 Background includes a brief site history, a description of the proposed plan to convert the Upper Mines to a recreational facility (planned redevelopment activities), and a summary of prior environmental investigations at the Upper Mines. Issues of concern are also discussed in this section.

Section 3 Development of Cleanup Objectives and Goals includes a discussion of the current and future land use, contaminants of concern (COC), exposure pathways and applicable standards that were considered when developing cleanup objectives and goals for the Upper Mines. Resulting cleanup objectives and goals for the Upper Mines are also described in this section.

Section 4 Identification of Cleanup Alternatives identifies and describes three proposed cleanup alternatives, including a "No-Action" alternative.

Section 5 Detailed Analysis of Alternatives describes the criteria used to evaluate the proposed alternatives. The cleanup alternatives described in Section 4 are evaluated using the criteria established in this section.

Section 6 Comparison of Alternatives compares the proposed cleanup alternatives, identifies a preferred alternative, and provides a discussion describing the selection of the preferred alternative.

Section 7 Preferred Alternative Statement of Work describes the preferred alternative in detail, and provides a timeline of completion milestones, a cost estimate, and summaries of the Health and Safety Plan and the Community Involvement Plan.

Section 8 References provides references for reports cited in this document.

SECTION 2.0 BACKGROUND

Section 2.0 of the Final Workplan (TerraGraphics 2007a) provides a detailed background of the Bayhorse Townsite, including site location and description, site use history, site development plan, site characterization and issues of concern specific to the Townsite. The following sections provide background information that is specific to the Upper Mines; however, background information for both the Townsite and the Upper Mines was considered during the preparation of this amendment.

2.1 Site Location and Description

The Upper Mines are located near the Bayhorse Townsite, a well-known "ghost town" near Challis, Idaho (See Figure 1.1). The Pacific Mine is located within the Bayhorse Mining District in Custer County, Idaho, approximately 34 miles northeast of Stanley, Idaho, 10 miles southwest of Challis, Idaho. The Pacific Mine consists of 200 acres located on patented mining properties surrounded by national forest and within Custer County, Idaho.

The Beardsley-Excelsior Mine is approximately 32 miles northeast of Stanley and 8 miles southwest of Challis (County seat); contained within Section 2, Township 12N, Range 18E, at the Boise Meridian. The Beardsley-Excelsior Mine consists of 40 acres located on patented mining properties surrounded by national forest and within Custer County, Idaho.

2.2 Site Use History

The Pacific Mine is comprised of 14 claims, which were patented between 1896 and 1921. The Pacific Mine's date of discovery could not be determined, but the Salmon River Mining Company operated it, and later the Pacific Mine was consolidated into the James McGregor Group with lessees operating the Pacific Mine from 1901 to 1908, producing lead, copper, silver and gold. The Pacific Mine remained inactive until 1942 when it was optioned to W. B. Swigert of Challis. Swigert Mines operated the Pacific Mine until 1950, though American Smelting and Refining Company obtained an exploration lease in 1945. Swigert Mines produced 633 tons of lead-silver ore in 1943; treated 10,365 tons of oxide lead-silver ore by gravity separation in 1944-45; treated 12,000 tons of zinc-lead ore by gravity separation in 1946; and produced another 1,262 tons of zinc-lead ore in 1947.

In 1951, Bayhorse Mines, Inc. assumed possession of the Pacific Mine and operated it briefly in 1955, with an 85-ton/day gravity and flotation mill to process ore. The Bunker Hill Company leased the James McGregor Group, including the Pacific Mine, in 1957-58 for exploration, but failed to prove additional sulfide reserves. In 1959, Umont Mining, Inc. entered into lease and option agreements and conducted exploration activities in 1961, and the Salmon River Sheelite Company leased the property in 1964. Later, interest in fluorite reserves prompted exploration by NL Industries in 1972-73 and Inspiration Development Inc. in 1979-81. Umont Mining, Inc. was the owner of record of these patented claims.

The Beardsley-Excelsior lead and silver ore body was discovered in the 1870s and began production in 1880. It was one of the major producers in the Bayhorse Mining District. During the 1800 and 1900's, ore from the Beardsley-Excelsior Mine was transported down Beardsley Gulch to the Bayhorse Townsite, where it was milled and smelted. Ramshorn Mines Company acquired the Beardsley-Excelsior Mine in 1920 and conducted mining operations until 1926. Ramshorn Mines then leased the operation until 1948. Bunker Hill conducted limited exploration at the Beardsley-Excelsior Mine from 1956 to 1958. Umont Mining then purchased the Beardsley-Excelsior Mine from Ramshorn Mines, but did not conduct mining operations on-site.

IDPR purchased these properties from Umont Mining in June 2006 in order to preserve the Upper Mines as part of a larger Bayhorse Mining District State Park.

A number of environmental investigations have been conducted at the Upper Mines in recent years. IDEQ and IDPR, with funding from the Idaho Brownfields Program, completed a preliminary site assessment, a baseline risk assessment, and the *Addendum to Bayhorse Site Risk Assessment and Proposed Risk Management Plan: Upper Mines Risk Management Plan* (Upper Mines Risk Management Plan) (TerraGraphics 2006a). These investigations revealed that the Upper Mines are contaminated by heavy metals due to primitive milling and smelting technologies employed in this remote area in the late 1800s and early 1900s and poses excessive health risks to humans if not cleaned up.

Concerns at the Pacific Mine stem from historic mining activity. The Pacific Mine presents risks to human health. Phase I and II Assessments conducted by IDEQ's environmental contractors in 2003, 2004 and 2005 confirmed that the Pacific Mine is contaminated with elevated levels of lead, arsenic and antimony. Human health risk assessments conducted by IDEQ contractors determined current heavy metal concentrations represent an excessive and substantial health risk to recreational users, construction workers and seasonal employees. Waste rock and soil lead concentrations collected at the Pacific Mine range from 140 milligrams per kilogram (mg/kg) to 44,423 mg/kg. Arsenic concentrations range from <10 mg/kg to 348 mg/kg at the Pacific Mine.

The Pacific Mine contains two distinct areas that will be cleaned up in order to develop the State Park. These areas are known as the Upper Pacific and the Lower Pacific Mines.

Significant lead levels were observed at the Pacific Mine. The most contaminated areas are located at the Upper Pacific Mine near the Central Processing Area, where several adits, a small mill, an ore chute, remains of a mine rail transport system, and a Bunkhouse area located. The Upper Pacific Mine has several known physical and environmental hazards located near and within the Central Processing Area. Lead and arsenic concentrations in soils collected near the Bunkhouse were as high as 1,247 mg/kg lead and 36 mg/kg arsenic. Lead and arsenic concentrations in waste rock and soil collected from several locations within the Central Processing Area were as high as 42,300 mg/kg lead and 141 mg/kg arsenic. There are also numerous physical hazards in this area; three open adits and associated waste dumps and several deteriorating buildings. A large fuel tank sits near one adit opening and three sections of mine rail extend from the main adit

to several metal ore bins. Soils adjacent to an adit opening show the highest lead concentrations in the Central Processing Area (42,300 mg/kg lead).

The Lower Pacific Mine consists of two landings located down slope and to the east of the Upper Pacific Mine. An existing trail passes through the upper landing, which contains an open adit, some buildings, and a tailings dump. The lower landing is down slope and north of the upper landing. The upper and lower landings are easily accessible by trail users and have sufficiently interesting features to attract visitors to stop and explore the area, including two adits that are sizeable enough to accommodate a large dump truck. All of the samples collected from the Lower Pacific, with the exception of two samples collected from a tailings dump on the upper landing (17,400 mg/kg lead and 44,423 mg/kg lead), were not high enough to require remediation or precautionary measures.

Concerns at the Beardsley-Excelsior Mine stem from historic mining activity. The Beardsley-Excelsior Mine presents both (1) risks to human health; and (2) risks to nearby water bodies; specifically Beardsley Gulch, an intermittent creek that experiences seasonal runoff that flows to Bayhorse Creek and ultimately to the Salmon River. Several threatened and endangered species (i.e., Bull trout, Steelhead, and Chinook and Sockeye salmon) are known to populate the Salmon River. Phase I and II Assessments conducted by IDEQ's environmental contractors in 2003, 2004 and 2005 confirmed that the Beardsley is contaminated with elevated levels of lead, arsenic and antimony. Human health risk assessments conducted by IDEQ contractors determined current heavy metal concentrations represent an excessive and substantial health risk to recreational users, construction workers and seasonal employees. IDEQ's contractors determined contaminants from the workings at the Beardsley-Excelsior Mine could enter the Beardsley Gulch and be transported downstream to the creek during high flow events.

Significant lead levels were observed at the Beardsley-Excelsior Mine. The most contaminated areas are adjacent to adit openings at the Beardsley-Excelsior Mine and under an elevated mine rail transport system. Ore tailings were used as ballast under the rail trestle, exposing highly contaminated material to wind and water transport and human contact. A sample collected from the trestle bed showed concentrations of 43,300 mg/kg lead and 100 mg/kg arsenic. During high water events, Beardsley Gulch runs directly through the trestle bed and appears to be actively eroding the tailings. Waste rock and soil lead concentrations collected at the Beardsley-Excelsior Mine range from 45 mg/kg to 45,200 mg/kg. Arsenic concentrations range from <10 mg/kg to 183 mg/kg at the Beardsley-Excelsior Mine.

Following the preliminary assessment, IDPR and IDEQ produced a site development plan designed to accommodate the Upper Mines' recreational and historic preservation needs while reducing the potential for visitors to come in contact with physical and environmental hazards. The site development plan for the Upper Mines is described in Section 2.3 and is shown in Figure 2.1.

After the formation of this site development plan, IDEQ completed a Risk Management Plan for the Upper Mines (TerraGraphics 2006a). The Upper Mines Risk Management Plan used a risk-based cleanup approach that is protective of public health and the environment and accommodates the recreational, cultural, and historic nature of the Upper Mines. An important component of the redevelopment plan is the preservation of the area's rich mining history. As a result, the Upper Mines Risk Management Plan did not consider some cleanup options, such as the demolition of historic structures, large-scale removal of native plants, or the use of some modern construction materials that could diminish the area's historic character. The cleanup alternatives proposed in this amendment have been developed based on the proposed site development plan and specific cleanup elements described in the Upper Mines Risk Management Plan.

2.3 Site Development Plan

IDPR, IDEQ and TerraGraphics produced a detailed development scheme in April and June 2005 to accommodate the recreational and historical preservation needs while reducing exposures at key locations for the Bayhorse Townsite. The site development plan was extended to include the Upper Mines in the Upper Mines Risk Management Plan and is described below. Figures 2.2 through 2.5 show pre-cleanup soil concentrations. Figures 2.6 through 2.8 show the key elements of IDPR's Upper Mines site development plan.

The Upper Mines Trail System (hereinafter also referred to as the "Trail") will utilize a series of existing trails and roads located within the Bayhorse Mining District, and on U.S. Bureau of Land Management and U.S. Forest Service (USFS) property (Figure 2.1). Lead and arsenic concentration in soil samples collected from the Trail were at or below acceptable soil levels and, as a result, do not require cleanup. Soil concentrations for the Trail are shown in Figure 2.5. An exit trail at the southwest corner of the Slag Pile parking area will allow trail users to access the Trail without passing through the Townsite. The Trail System will be engineered to encourage users to stop and rest at clean oases. Amenities such as benches, picnic tables, scenic viewpoints, interpretive signage, hiking trail access points, and ATV parking and turn-around areas will be provided at selected key points on the Trail. These key trail areas are described below.

The Bayhorse Townsite Overlook is the first viewpoint on the Upper Mines Trail. This overlook provides trail users with a clear view of the Townsite Mill, Slag Pile, Tailings Pile, Smelter, and other historic Townsite structures. At this point in the trail, IDPR will construct an interpretive area with benches, signage, and ATV parking that will overlook the Bayhorse Townsite.

The Beardsley-Excelsior Mine is located to the northeast of the Townsite. The Trail passes between two structures of significant historical interest at this mine; a mine adit and an elevated trestle. The Beardsley-Excelsior Mine upper landing is accessible by foot about 100 feet north of this point in the trail. As discussed in Section 2, some waste rock and soil samples collected at the Beardsley-Excelsior Mine upper landing and in material under the elevated trestle bed show elevated lead concentrations. Figure 2.2 shows the location of mine structures and pre-cleanup soil concentrations at the Beardsley-Excelsior Mine.

An ATV turn-around with interpretive signs and benches will be constructed north of the mine adit to encourage trail users to stop and access the upper landing, where they can view existing mine structures, on foot. Access to some parts of the Beardsley-Excelsior Mine area will be restricted. Extensive fencing and signage will be used to keep visitors from accessing areas where physical and environmental hazards exist. The mine adit will be blocked and fenced to keep visitors from entering the mineshaft. The trestle will be fenced and signed to inform visitors of the physical and environmental hazards associated with accessing the trestle. To stop potential recontamination downstream, the trestle bed may need to be removed or retained to stop tailings from entering the Beardsley Gulch creek bed. Figure 2.6 shows proposed access controls and post-cleanup soil concentrations at the Beardsley-Excelsior Mine.

The Keystone Junction will be located where the Upper Mines Trail meets the trail to the Keystone Mine, located on USFS property, after crossing Beardsley Creek. A trail sign indicating directions to Keystone Mine, the Pacific Bunkhouse, and the Top of the Pacific Mine Viewpoint will be located at this junction. Access from the Keystone Mine Trail will be restricted to keep trucks from entering the Upper Mines Trail system. ATV access will not be restricted at this junction.

The Pacific Junction will be located at a major switchback and intersection where trail users can continue north on the Upper Mines Trail to the Pacific Bunkhouse or west to the Top of the Pacific Mine Viewpoint. The Pacific Junction will be located on the south slope overlooking the Townsite.

The Pacific Mine will be a key stopping point on the Upper Mines Trail. An interpretive area with benches, signs and an ATV turn-around will be constructed using clean material at the entrance to the Pacific Mine. The Pacific Mine will be accessible by foot from this point in the Trail. Because elevated lead concentrations were found near the Pacific Bunkhouse and in waste rock and soil collected from several locations, an interpretive walking trail will be constructed using clean material. Figure 2.3 shows the pre-cleanup soil concentrations at the Pacific Mine. Fencing and signage will be used to keep visitors from accessing areas where physical and environmental hazards exist. Footpaths will be constructed using clean material that will allow visitors to view the specific features at the Pacific Mine. Figure 2.7 shows proposed access controls and post-cleanup soil concentrations at the Pacific Mine.

The Top of the Pacific Mine Viewpoint can be accessed by two different trails. At the first switchback past the Keystone Junction on the Upper Mines Trail, the Trail splits and one branch heads west around the back of the Pacific Mine, then heads southeast to the Top of the Pacific Mine Viewpoint. The other branch heads south from this switchback to the Pacific Junction where trail users can choose to go north to the Bunkhouse or west to the Top of the Pacific Mine Viewpoint (Figure 2.1). The trail could be gated at the junction of these two braches to restrict trail users from accessing certain areas of the Pacific Mine, if necessary, and still allow maintenance access to the Top of the Pacific. Adit entrances and shafts in this area should be fenced and signed to preclude access.

The Lower Pacific Mine consists of two landings located down slope and to the north of the Pacific Mine. There are two buildings, an outhouse, an open adit, and a tailings dump located at the upper most landing. There are two large adits and a large tailings pile at the lower landing. These two landings are included in the Upper Mines Risk Management Plan as a part of the Pacific Mine, as they are easily accessible by trail users and have interesting features sufficient to attract visitors to stop and explore the area. Figure 2.4 shows the pre-cleanup soil concentrations and Figure 2.8 shows proposed access controls and post-cleanup soil concentrations at the Lower Pacific Mine.

2.4 Site Characterization

IDEQ conducted limited field investigations at the Pacific and Beardsley-Excelsior Mines in 2003, and additional site assessments through the State Brownfields Program in 2004 and 2005. Prior to purchasing these properties, IDPR requested assistance from Federal, State and local agencies to evaluate the Pacific and Beardsley-Excelsior Mines. IDEQ and IDPR, with funding from the Idaho Brownfields Program, completed a preliminary site assessment, a baseline risk assessment, and risk management plan. The purpose of these investigations was to characterize contamination and associated environmental and human health risks at the Pacific and Beardsley-Excelsior Mines.

2.4.1 IDEQ Preliminary Assessment

IDEQ conducted limited field investigations and soil sampling at the Pacific and Beardsley-Excelsior Mines in 2003 prior to entering into discussions with IDPR regarding potential Brownfields redevelopment. During this assessment, IDEQ collected limited soil samples and investigated potential exposure and contaminant migration pathways, including groundwater, air, soil, and surface waters (IDEQ 2003a and 2003b).

IDEQ investigated potential migration and exposure pathways including groundwater, air, soil, and surface waters. It was determined that drinking water wells existed within the 4-mile Target Distance Limit (TDL) of the Pacific and Beardsley-Excelsior Mines. Three drinking water wells are located within the TDL of the Pacific Mine. IDEQ estimated that 4.2 people are served by these wells. Nine domestic water wells are located within four miles of the Beardsley-Excelsior Mine. IDEQ estimated that 12.5 people are served by these wells (IDEQ 2003a and 2003b).

Receptors, including slate mine employees, Bayhorse Campground users, and recreationists (i.e., ATV users, hunters) were identified for both air and soil exposure pathways (IDEQ 2003a and 2003b).

Beardsley Gulch, Bayhorse Creek and the Salmon River are located within at least one site's TDL. However, no commercial or subsistence fishing was observed by IDEQ within the surface water TDL for all mine sites. IDEQ noted that sport fishing does occur in beaver ponds along Bayhorse Creek and downstream on the Salmon River and that surface water is used for watering livestock and field irrigation. There were no drinking water intakes from surface water bodies within the TDL (IDEQ 2003a and 2003b). Bull Trout, Steelhead, and Chinook salmon, which are each listed as threatened species, and Sockeye Salmon, which is listed as an endangered species, are known to populate the

Salmon River. The Gray Wolf, listed as a threatened species in Idaho, and the North American Wolverine, listed as a watch species, are known to populate the area within a four-mile radius of the Townsite. Two plant species of concern, the Wavy-Leaf Thelypody and the Challis Milkvetch were also found within four miles of the Townsite (IDEQ 2003a and 2003b).

2.4.2 Brownfields Preliminary Site Assessment

In 2004, IDPR and IDEQ contracted Maxim Technologies to complete a preliminary site assessment of the Bayhorse Mining Area (Maxim 2004, Maxim 2005). IDEQ provided funds to conduct this assessment through the Idaho Brownfields Program.
During the assessment, adits, exploration openings, waste rock dumps, potentially hazardous materials, structures, and springs and seeps were located using Global Positioning System (GPS) technology and soil samples were collected from areas of significant mining activity and/or historic interest.

Soil, tailings, waste rock, and ore samples were collected from the Pacific and Beardsley-Excelsior Mines. Lead concentrations at the Pacific Mine ranged from 140 mg/kg to 44,423 mg/kg. Arsenic concentrations ranged from <10 mg/kg to 348 mg/kg. At the Beardsley-Excelsior Mine, lead concentrations ranged from 45 mg/kg to 45,200 mg/kg and arsenic concentrations ranged from <10 mg/kg to 183 mg/kg. The highest lead result was from an ore tailings sample collected from an abandoned rail trestle bed near Beardsley Gulch.

A risk assessment was performed for each mine within the Bayhorse Mining District. Maxim Technologies determined that risk assessment target levels (RATLs) were exceeded for antimony, arsenic, cadmium, copper, manganese, mercury, silver, and zinc at the Pacific and Beardsley-Excelsior Mines. IDEQ's target cancer risk (1×10^{-5}) and hazard index (HI=1) were not exceeded at the Pacific Mine and Beardsley-Excelsior Mine. Lead health risks were not assessed.

2.4.3 Baseline Risk Assessment

Following review of Maxim's preliminary site assessment and IDPR's site development plan, IDEQ developed an additional risk assessment for the Bayhorse Mining District to evaluate risk posed by exposures to contamination found throughout the entire mining area, as opposed to risk by exposures to contamination found at each individual mine site.

To accomplish this, representative concentrations were calculated for three exposure scenarios (adult and child recreational visitors and on-site seasonal Park staff) based on time spent at each individual mine site and in contaminated versus relatively uncontaminated areas at each mine. IDEQ performed a risk evaluation for the following contaminants found at the Bayhorse Mining District: antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc.

RATLs were exceeded for antimony, arsenic, cadmium, copper, iron, manganese, and mercury. Target cancer risk (1×10^{-5}) and non-cancer risk (HI=1) were exceeded for on-site staff and child and adult recreational visitors. Consistent with the findings in Maxim's preliminary site assessment (Maxim 2005), non-lead risk for the entire mining

area was primarily driven by arsenic and antimony. Lead health risk was not assessed.

2.4.4 Bayhorse Site Risk Assessment and Proposed Management Plan

IDEQ and IDPR engaged TerraGraphics to develop the *Bayhorse Site Risk Assessment and Proposed Risk Management Plan* (Risk Management Plan) (TerraGraphics 2005a).

In support of the Risk Management Plan, limited samples were collected in April 2005 from the Upper Mines. Quality assurance procedures developed for the Coeur d'Alene Basin Superfund Site and described in the *Final Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) for the 2005 Property Sampling in the Coeur d'Alene River Basin of Idaho* (Basin SAP/QAPP) were followed during this sampling effort (TerraGraphics 2005b). The sampling process design for soil areas for 1-inch surface samples, decontamination, and sample handling, preservation, and preparation procedures outlined in the Basin SAP/QAPP were followed in the field. Quality control checks described in the Basin SAP/QAPP were also followed. Protocols for sample analysis were described in a technical memorandum to IDEQ prior to sampling (TerraGraphics 2005c).

The Risk Management Plan was developed largely in support of IDPR's and IDEQ's decision-making processes regarding the acquisition, cleanup, and conversion of the Bayhorse Townsite and the Upper Mines to a State Park. The Risk Management Plan characterized health risks associated with lead and arsenic. (Although IDEQ also identified antimony as a potential contaminant of concern, it was expected cleanup of arsenic- and lead-contaminated soils will address antimony contamination in soils). The Risk Management Plan also recommended exposure management strategies to minimize these risks (including cleanup, access controls, institutional controls, education/warnings, training and personal protection), developed and evaluated risk-based cleanup criteria for the Townsite, and described specific cleanup elements necessary to ensure a safe environment for Park visitors and workers.

It was determined that exposures to pre-cleanup heavy metal concentrations at the Site would likely result in excessive health risks to recreational visitors and occupational workers. Risk analysis showed that a combination of engineering and institutional controls proposed in the Risk Management Plan would reduce most of these health risks. For more details, see the *Bayhorse Site Risk Assessment and Proposed Risk Management Plan* (TerraGraphics 2005a).

2.4.5 Addendum to Bayhorse Site Risk Assessment and Proposed Risk Management Plan: Upper Mines Risk Management Plan

In June and July of 2006, additional soil samples were collected from the Upper Mines Trail and from the Upper Mines to support an *Addendum to Bayhorse Site Risk Assessment and Proposed Risk Management Plan* (TerraGraphics 2006a) that address the Upper Mines.

In June 2006, TerraGraphics conducted a site visit to identify contaminated areas that had not been previously characterized and identify areas for sample collection needed to support finalization of the Risk Management Plan. Samples were collected from the Upper Mines Trail. Several area-wide composites of top-inch soils intended to represent

surface conditions accessible to visitors were collected over the 3-day visit. All samples were sieved to -80 mesh and analyzed for lead and arsenic by X-ray fluorescence (XRF). Sample results and locations are described in detail in Appendix A of the *Phase I Environmental Site Assessment and All Appropriate Inquiry* report (TerraGraphics 2006b).

During the June 2006 site visit, it was determined that i) no substantive changes had occurred at the locations visited in 2005 and the conditions and conclusions of earlier TerraGraphics reports remain valid, ii) no significant changes in conditions and characteristics reported by IDEQ, Maxim Technologies and Idaho Geological Survey were noted and as a result these studies can be used in assessing current site conditions, iii) several additional mine dumps and one major mine facility (named the Lower Pacific) exist at the site that were not previously identified or sampled. It was determined that the Lower Pacific should be characterized and added to the proposed risk management plan, and iv) no concentrations requiring remediation or precautionary measures were found among the Upper Mines Trail samples.

During July 2006, TerraGraphics conducted additional soil sampling in support of the risk management plan and to better characterize the Pacific, the Lower Pacific, and the Beardsley-Excelsior Mines. At each mine, all areas that were determined to be relatively accessible to visitors were characterized. Accessible areas were divided into sub-areas based on physical characteristics such as vegetation type, slope, accessibility, and mine features. Each sub-area was then mapped, GPS-located, and sampled. Area-wide composites of top-inch soils intended to represent surface conditions accessible to visitors were collected. Unprocessed, bagged soil samples were analyzed in the field for metals (including lead and arsenic) using a Niton portable XRF machine configured to operate on bulk soil mode for a run time of 30 seconds.

Acceptable cancer risks were exceeded for arsenic for recreational visitors, occupational workers, and construction workers at the Upper Mines. Surface soil lead concentrations are extremely high at the Upper Mines and would result in excessive risk to child visitors and fetuses of female Park employees, construction workers, and recreational visitors.

2.4.6 Phase I Environmental Site Assessment and All Appropriate Inquiry

In July 2006, following review of the Risk Management Plan, IDPR entered into negotiations with the Umont Mining Company to purchase the Bayhorse Townsite and three upper mine sites, with an option to purchase the Skylark-Ramshorn Mine at a later date. In order to comply with the requirements of the Bonafide Prospective Purchasers exemption, IDPR contracted TerraGraphics to perform a Phase I Environmental Site Assessment (ESA) and All Appropriate Inquiry (AAI) on the Bayhorse Townsite and Unnamed South Parcel/Riverview, Beardsley-Excelsior, Pacific, and Skylark-Ramshorn Mines.

In the ESA/AAI, TerraGraphics recommended the following (TerraGraphics 2006b):

- Completion of all elements of the *Bayhorse Site Risk Assessment and Proposed Risk Management Plan* (TerraGraphics 2005a) including access control with gates and fences, signage, and removal of contaminated soils.
- Bi-yearly sampling of common use areas to confirm recontamination is not occurring after completion of the Risk Management Plan.
- Proper removal and disposal by certified and/or experienced personnel following local, State, and Federal regulations of those items identified as potentially hazardous (i.e., tailings, soils, 55-gallon drums of oil, compressed air tanks, large above ground tanks, batteries, etc.).
- Consideration of seismic hazards in the area prior to any new proposed construction. Any new structures should be engineered appropriately.
- Land restrictions on future residential use.
- Adits be secured and closed with appropriate measures including installation of bat gates.
- Open shafts and stopes be fenced and/or backfilled when appropriate.

2.5 Issues of Concern

Previous reports confirmed that the Pacific and Beardsley-Excelsior Mines are contaminated with high levels of both lead and arsenic that represent excessive risk to human health. Unrestricted access to recreational users and unprotected construction, salvage, or development activities could result in dangerous exposures, even for short-term activities. In addition, seasonal runoff in the Beardsley Gulch appears to be actively eroding the tailings from under an abandoned rail trestle. A sample collected from the trestle bed showed concentrations of 43,300 mg/kg lead and 100 mg/kg arsenic.

SECTION 3.0 DEVELOPMENT OF CLEANUP OBJECTIVES AND GOALS

Section 3.0 of the Final Workplan (TerraGraphics 2007a) provides a detailed description land use, COCs, exposure pathways, and cleanup goals and objectives specific to the Townsite. The following sections provide information specific to the Upper Mines; however, information for both the Townsite and the Upper Mines was considered during the preparation of this amendment.

3.1 Land Use

3.1.1 Current Land Use

Currently, the Upper Mines are not actively mined and no mineral processing is occurring. The Pacific and Beardsley-Excelsior Mines are closed to the public; however, it appears seasonal recreationists may be accessing the Upper Mines via non-maintained roadways and trails. There are currently no land use restrictions at the Upper Mines.

3.1.2 Anticipated Future Land Use

The cleanup and redevelopment of the Upper Mines is part of the first phase of IDPR's plan to construct a larger State Park. The Park will include the Townsite and three remote upper mine sites located in the Bayhorse Mining District. The Townsite will double as a trailhead, primarily for ATV users to access the Upper Mines and back country trails that will eventually connect to the Yankee Fork area, the towns of Custer and Bonanza, and other trailheads. A visitor's center and on-site Park staff will offer interpretive and self-guided walking tours on prescribed paths within the Townsite. Anticipated future land use at the Upper Mines is described in more detail in Section 2.3 of this amendment.

Future land use restrictions are recommended for the Upper Mines including an Institutional Controls Program (ICP) that includes worker health and safety protocols consistent with the anticipated future use as a State Park. It is also suggested that residential use restrictions be placed on those areas of the Park that have not been cleaned to acceptable residential soils levels.

3.1.3 Regional Land Use

The regional land use for the Upper Mines is the same as the Townsite and is described in Section 3.1.3 of the Final Workplan (TerraGraphics 2007a).

3.1.4 Groundwater Use

No groundwater is currently being used as a water source at the Pacific and Beardsley-Excelsior Mines.

3.1.5 Surface Water Use

No surface water is currently being used as a water source at the Pacific and Beardsley-Excelsior Mines, but may be developed in the future for Park facilities and fire suppression, if permissible.

3.2 Contaminants of Concern

IDEQ performed a risk evaluation for the following contaminants found at the Bayhorse Mining District: antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc.

The *Addendum to Bayhorse Site Risk Assessment and Proposed Risk Management Plan: Upper Mines Risk Management Plan* (TerraGraphics 2006a) identified lead and arsenic as the main COCs at the Upper Mines.

3.3 Exposure Pathways

The exposure pathways for the Upper Mines are the same as the Townsite. These pathways are described briefly below and in more detail in Section 3.3 of the Final Workplan (TerraGraphics 2007a).

The primary exposure pathway of concern is ingestion of contaminated soil. No groundwater is currently being used for drinking water at the Pacific and Beardsley-Excelsior Mines. The primary COCs related to soil ingestion are lead and arsenic.

3.4 Applicable Standards

Remediation at the Upper Mines will be conducted through the IDEQ VCP. Cleanup actions under the VCP must provide for adequate protection of human health and environment based on the current and future uses of the property. There are no applicable cleanup standards for recreational exposures to soils contaminated with arsenic and lead. However, there are several human and ecological health standards that are relevant to the Townsite and Upper Mines and should be considered during and after cleanup. These standards are described in detail in Section 3.4 of the Final Workplan (TerraGraphics 2007a).

3.5 Cleanup Goals and Objectives

As with the Townsite, the overall cleanup goal for the Upper Mines is to reduce risks to both human health and the environment. The cleanup goal and objectives are described in more detail in Section 3.5 of the Final Workplan (TerraGraphics 2007a). The strategy to achieve the cleanup goal at the Upper Mines and the Townsite is described briefly below.

The Risk Management Plan and the Upper Mines Risk Management Plan propose the cleanup of select areas and the use of access controls to reduce the overall exposure concentration at the Townsite and Upper Mines to less than 500 mg/kg lead and 50 mg/kg arsenic. It was determined that an overall concentration less than 500 mg/kg lead and 50 mg/kg arsenic would not pose an unacceptable health risk to recreational visitors and Park workers. This reduction in overall soil levels will be accomplished by the replacement or capping of soils with lead concentrations equal to or greater than 1,200 mg/kg with clean material in all proposed public access areas of the Park. Non-remediated areas with soil concentrations equal to or greater than 1,200 mg/kg will be fenced and visitors and Park staff will be restricted from accessing areas where contamination remains in place. See the Risk Management Plan (TerraGraphics 2005a) and the Upper Mines Risk Management Plan (TerraGraphics 2006a) for more details.

SECTION 4.0 IDENTIFICATION OF CLEANUP ALTERNATIVES

The Upper Mines Risk Management Plan describes cleanup elements necessary to ensure a safe environment for visitors to the Upper Mines (See Figures 2.6 through 2.8). As part of the analysis of cleanup alternatives, cleanup and design criteria were established for each of these cleanup elements. As with the Townsite, cleanup criteria for the Upper Mines were established using a risk-based approach and applicable standards in order to be protective of human health and the environment. Design criteria were established based on IDPR's use specifications and recreational and historical preservation requirements for the Upper Mines. Some of the cleanup elements and associated criteria that will be employed at the Upper Mines are the same as those that will be employed at the Townsite. Both those elements that are specific to the Upper Mines and those that are identical to the Townsite are discussed below.

4.1 Upper Mines Cleanup Elements

4.1.1 Cleanup of Roads and Development of Walking Trails

This element includes replacing or covering soils on existing Upper Mines roads and designated trails with a clean material. Cleanup of roads and development of walking trails will provide access through the Upper Mines. Fencing will be installed to keep visitors away from contaminated areas adjacent to the trails.

Cleanup Criteria for the Upper Mines walking trail require that surface soil concentrations equal to or greater than 1,200 mg/kg lead be replaced or covered with clean material.

*Design Criteri*a: Alternatives for development of a walking trail should i) isolate contaminated soils from humans and ii) provide Park maintenance vehicle access to various areas of the Upper Mines.

Proposed approach: Existing roads and trails will be converted into a walking trail that services most of the areas of the Upper Mines, allowing visitors to view historic features at the Upper Mines. The trail will be replaced or covered with clean material and fenced to limit visitor access to contaminated features.

4.1.2 Cleanup of Historic Buildings/Structures and Yards

This cleanup element allows visitors to view historic buildings and/or structures at the Upper Mines via clean public access areas.

Cleanup Criteria for the historic Upper Mines buildings and structures require that surface soil concentrations in public access areas equal to or greater than 1,200 mg/kg lead be replaced or covered with clean material. If visitors are allowed to enter the buildings or structures, interior metal concentrations should be low enough for acceptable human health exposure.

Design Criteria require that cleanup alternatives for historic Upper Mines buildings and/or structures provide visitors with a safe environment to view historic mining features at the Upper Mines. Buildings and structures must be structurally sound and interior metal concentrations should be low enough for acceptable human health exposure if visitors are granted access to the interiors.

Proposed approach: Clean access routes and interpretive areas will be developed for visitors to view select buildings and structures at the Upper Mines. Access to the interiors will be restricted. In addition, at such time as IDPR obtains funding to remediate these buildings or structures, access to the interiors will be allowed.

4.1.3 Cleanup of Solid and Hazardous Waste

This cleanup element includes the safe, proper disposal of solid and hazardous wastes that exist at the Upper Mines and follows the same criteria and approach as described in Section 4.1.7 of the Final Workplan (TerraGraphics 2007a).

4.1.4 Access Restrictions

This cleanup element includes restricting public access from areas where physical and environmental hazards exist and follows the same criteria and approach as described in Section 4.1.8 of the Final Workplan (TerraGraphics 2007a).

4.1.5 Monitoring and Maintenance of the Remedy

This cleanup element includes development of a long-term monitoring program and erosion and institutional controls to reduce the potential for recontamination following cleanup of the Upper Mines. A monitoring program will be developed to include both the Townsite and the Upper Mines and follows the same criteria and approach as described in Section 4.1.9 of the Final Workplan (TerraGraphics 2007a).

4.2 Cleanup Alternatives

Various cleanup alternatives were developed for each of the cleanup elements described above. Each alternative was required to meet the cleanup and design criteria established for its corresponding cleanup element. If the alternative did not meet these criteria, it was not considered for further evaluation.

The two alternatives for each cleanup element that most closely met the cleanup and design criteria listed in Section 4.0 were included in the comparative ABCA.

The following sections describe the three proposed cleanup alternatives, including a No-action Alternative, for the Upper Mines.

The main elements of *Alternative 1* include:

- Removal and replacement of soils ≥ 1,200 mg/kg lead from all public access and trail areas (including walking trails, maintenance roads, and ATV turn-around and parking areas),
- use of gravel or other clean material as clean cover,
- disposal of contaminated soils in the Townsite Slag Pile repository,
- use of vegetation, logs and soil wraps with imported fill material in order to control erosion of trestle tailings by Beardsley Gulch run-off and
- chain link fencing.

The main elements of *Alternative 2* include:

- Capping of soils ≥ 1,200 lead in all public access and trail areas (including walking trails, maintenance roads, and ATV turn-around and parking areas),

- use of a cellular confinement system for subgrade stabilization and clean material as clean cover,
- no excavation or disposal is required for this alternative,
- use of native rock to control erosion of trestle tailings by Beardsley Gulch run-off and
- historic log fencing.

Alternative 3 includes no remedial action.

4.2.1 Alternative 1

The most extensive cleanup alternative at the Upper Mines includes excavating and replacing soils with lead concentrations equal to or greater than 1,200 mg/kg from all proposed public access and trail areas.

Soil in *Public Access Areas*, *Trails, and Turn-around/Parking Areas* with concentrations exceeding acceptable criteria (1,200 mg/kg) will be removed or capped with 12" of clean material (i.e., gravel and soil). Existing roads and trails will be converted into walking trails and turn-around /parking areas. Excavated soils will be placed in the Townsite Slag Pile repository.

Erosion of the Trestle Tailings Pile by seasonal runoff in Beardsley Gulch will be controlled using vegetation, logs and soil wraps with imported fill material to stabilize tailings near the creek bed.

Signage will be employed to provide warnings regarding physical and chemical hazards at the Upper Mines and to acquaint visitors with the technologies that produced the contaminated material. *Chain-link Fencing* will be constructed to keep visitors on clean trails and in clean public access areas.

Table 4.1 Summary of Proposed Cleanup Activities for Alternative 1

Cleanup Element	**Alternative 1**
Cleanup of Roads and Development of Walking Trails	Excavate and cap with 12" of clean material in all public areas with soil concentrations equal to or greater than 1,200 mg/kg lead.
ATV Turn-around and Parking Area Development	Excavate and cap with 12" of clean material in all public areas with soil concentrations equal to or greater than 1,200 mg/kg lead.
Disposal of Contaminated Soil	Utilize the Slag Pile repository at the Townsite for disposal of contaminated soils excavated from the Upper Mines.
Erosion of the Trestle Tailings Pile	Utilize vegetation, logs and soil wraps with imported fill to stabilize tailings pile.
Cleanup of Solid and Hazardous Waste*	Collection and off-site disposal
Access Restrictions	Utilize chain-link fencing to restrict public from accessing areas where contamination and/or physical hazards exist and to protect remedy.
Monitoring and Maintenance *	Implement long-term sampling and monitoring of cleaned areas, engineered erosion controls and an institutional controls program.

*The proposed cleanup for this element does not differ for Alternatives 1 and 2.

4.2.2 Alternative 2

A second alternative to cleanup the Townsite includes capping of soils with lead concentrations equal to or greater than 1,200 mg/kg with clean material in proposed public access areas.

Soil in *Public Access Areas*, *Trails, and Turn-around/Parking Areas* with concentrations exceeding acceptable criteria (1,200 mg/kg) will be capped with a cellular confinement system and 12" of clean material. The cellular confinement system consists of i) a layer of geotextile fabric, ii) an 8" deep cellular confinement web filled with 8" of clean gravel, iii) a second layer of geotextile fabric, and iv) 4" of clean trail cover. Figure C5 in Appendix B shows a cross section of the proposed capping system. Existing roads and trails would be converted into walking trails and turn-around/parking areas. Under this alternative, no contaminated soils will excavated from the Beardsley-Excelsior or Pacific Mines and, as a result, no repository for contaminated soil will be required.

Erosion of the Trestle Tailings Pile by seasonal runoff in Beardsley Gulch will be controlled using native rock to stabilize tailings near the creek bed. Figure C4 in Appendix B shows the area of the trestle tailings pile that will be retained and its proximity to Beardsley Gulch.

As with Alternative 1, *Signage* will be employed to provide warnings regarding physical and chemical hazards at the Upper Mines and to acquaint visitors with the technologies that produced the contaminated material. Signs warning visitors of the environmental and physical hazards that exist beyond the fence line will be placed at the entrance to each mine area, near the abandoned rail trestle, near the tailings dump at the Lower Pacific's upper landing, and at the Top of the Pacific. Additional signs may also be placed at key locations along the ATV trail.

Historic log fencing will be installed to keep visitors from accessing restricted areas and areas where contaminated soils are left in place.

Table 4.2 Summary of Proposed Cleanup Activities for Alternative 2

Cleanup Element	**Alternative 2**
Cleanup of Roads and Development of Walking Trails	Cap trails with a cellular confinement system and 12" of clean material all areas with soil concentrations equal to or greater than 1,200 mg/kg lead.
ATV Turn-around and Parking Area Development	Cap trails with a cellular confinement system and 12" of clean material all areas with soil concentrations equal to or greater than 1,200 mg/kg lead.
Disposal of Contaminated Soil	No repository would be required. Soils from fence post holes will be spread out on the trail prior to capping.
Erosion of the Trestle Tailings Pile	Utilize native rock to stabilize tailings pile and control erosion.
Cleanup of Solid and Hazardous Waste*	Collection and off-site disposal.
Access Restrictions	Utilize historic log fencing to restrict public from accessing areas where contamination and/or physical hazards exist and to protect remedy.
Monitoring and Maintenance *	Implement long-term sampling and monitoring of cleaned areas, engineered erosion controls and an institutional controls program.

*The proposed cleanup for this element does not differ for Alternatives 1 and 2.

4.2.3 Alternative 3

The No-Action Alternative assumes no remedial action will be taken at the Upper Mines and must be considered as part of the comparative analysis process. Cleanup costs of the No-Action Alternative would be zero, although limited costs have already been incurred for site investigations. Practically however, this alternative would prevent public use of the Upper Mines as part of a State Park due to risks posed by lead and arsenic contamination and physical hazards that currently exist at the Upper Mines. Public access to the Upper Mines should be restricted or prohibited if the Upper Mines are not cleaned up. Environmental conditions and risks would likely remain unchanged with no action at the Upper Mines.

SECTION 5.0 DETAILED ANALYSES OF ALTERNATIVES

5.1 Description of Evaluation Criteria

The three cleanup alternatives that were identified for the Upper Mines (see Section 4.0) were evaluated based on the following performance criteria: i) overall protection of human health and the environment, ii) long-term effectiveness, iii) the ability to meet the Park's use and design needs, iv) sustainability, v) ease to implement, and vi) cost. These performance criteria serve as a basis for conducting a comparative analysis of the proposed remedial alternatives and are described in detail in Section 5.1 of the Final Workplan (TerraGraphics 2007a).

5.2 Detailed Analysis of Alternatives

5.2.1 Detailed Analysis of Alternative 1

5.2.1.1 Overall Protection of Human Health and the Environment

Alternative 1 provides overall protection of human health and the environment. Removal and replacement of soils ≥ 1,200 mg/kg lead in public access and trail areas and fencing achieves risk-based cleanup objectives and results in acceptable soil exposure concentrations (<500 mg/kg lead and <50 mg/kg arsenic). Disposal in the Slag Pile prior to closure with a liner and gravel cap (Slag Pile) effectively isolates contaminated soil, slag, and tailings from direct human contact and reduces the potential for metals to migrate from the Slag Pile into Bayhorse Creek.

Erosion control measures proposed in this alternative would also prevent tailings migration from the abandoned rail trestle into Beardsley Gulch.

This option would remove the risk of direct human contact with contaminated soil through isolation of this soil in on-site repositories and under clean barriers. Existing contamination will remain in some areas of the Upper Mines. However, access to these areas will be restricted so that the public would not contact contaminated soils.

5.2.1.2 Long-term Effectiveness

Alternative 1 generally meets this criterion in that significant physical and chemical risks that remain at the Upper Mines will be adequately reduced following cleanup through a combination of institutional and access controls. However, the reliability of management controls (i.e., fencing, on-site staff, etc.) to provide continued protection from remaining hazards at the Upper Mines following cleanup is only moderate due to the isolated location of the Upper Mines and because Park staff will not be at the Upper Mines at all times. Educational materials and information provided by on-site staff at the Townsite, in addition to signs warning visitors of environmental and physical hazards at the Upper Mines, will help to curtail risky behavior at the Upper Mines.

There is some possibility of recontamination of clean areas due to transport of contaminated materials via runoff and wind; however, the proposed ICP will reduce the chance that the cap will be disturbed by Park staff and the proposed monitoring plan will identify any areas that have been recontaminated. The long-term effectiveness of this alternative is dependent on on-going maintenance at the Upper Mines (i.e., re-covering

areas where the cap has been worn down, eroded or disturbed or replacing recontaminated material with clean material), which will require some increased financial burden on IDPR.

The long-term effectiveness of erosion control measures proposed in this alternative would be acceptable as long as the vegetative cover on the trestle tailings at the Beardsley-Excelsior Mine was not disturbed (i.e., by animals), stressed (i.e., during a drought year) or diminished. If this cover were to be reduced, it would require replanting and maintenance to assure long-term effectiveness.

5.2.1.3 Ability to Meet the Park's Use and Design Needs

Overall, this alternative meets the Park's use criterion. However, the use of chain-link fencing will detract somewhat from the historic nature of the Park and, as a result, does not meet the Park's design needs. In addition, the large-scale excavation of contaminated soils ≥1,200 mg/kg lead (which includes most of the proposed public access areas) would result in the destruction of any native plants established at the Upper Mines.

5.2.1.4 Sustainability

Overall, the cleanup proposed in this alternative is fairly sustainable. The operation and maintenance activities necessary to sustain the proposed cleanup include i) maintaining fencing and signage at the Upper Mines, ii) instituting monitoring and institutional controls plans to reduce the likelihood of recontamination, iii) recovering or replacing areas of the gravel cap that have been worn down, eroded, disturbed or recontaminated, and iv) establishing and maintaining the vegetative cap on the rail trestle at the Beardsley-Excelsior Mine. Most of these activities are easily implemented with the exception of establishing and maintaining the vegetative cap on the rail trestle. The difficulties associated with construction and maintenance of this cap is discussed in Section 5.2.1.5 below.

5.2.1.5 Ease to Implement

Alternative 1 could be readily implemented and would not present any foreseeable technical problems. However, there are some potential difficulties getting excavation equipment to the Upper Mines on the existing roads and this alternative may require road improvements or the use of smaller trucks and excavators. This could result in increased mobilization and construction costs. In addition, it may be difficult to establish the vegetative cap proposed for stabilization of the rail trestle ballast at the Beardsley-Excelsior Mine due to limited water resources at the mine. The only water source at the Beardsley-Excelsior Mine is seasonal runoff in Beardsley Gulch. During the hot summer months when Beardsley Gulch is dry, the vegetative cap may require additional irrigation from other sources (i.e., a water truck).

5.2.1.6 Cost

The major costs in this alternative are for excavation, hauling, clean material and fencing. Clean material would likely be hauled to the Upper Mines from an off-site location and excavated material would be hauled from the Upper Mines to the Townsite Slag Pile. Operation and maintenance costs would be substantial for this alternative due to maintenance of the gravel cap. These costs have not been estimated at this time.

5.2.1.7 Compliance with Applicable Standards

Cleanup activities proposed for Alternative 1 comply with all applicable standards.

5.2.2 Detailed Analysis of Alternative 2

5.2.2.1 Overall Protection of Human Health and the Environment

Alternative 2 provides overall protection of human health and the environment. Capping of soils with concentrations ≥1,200 mg/kg lead in public access and trail areas and fencing achieves risk-based cleanup objectives and results in acceptable soil exposure concentrations (<500 mg/kg lead and <50 mg/kg arsenic) and effectively isolates contaminated soil, slag, and tailings from direct human contact.

Erosion control measures proposed in this alternative would also prevent tailings migration from the abandoned rail trestle into Beardsley Gulch.

As with Alternative 1, this option would remove the risk of direct human contact with contaminated soil through isolation of this soil under clean barriers. Existing contamination will remain in some areas of the Upper Mines. However, access to these areas will be restricted so that the public would not contact contaminated soils.

5.2.2.2 Long-term Effectiveness

Alternative 2 meets this criterion in that significant physical and chemical risks that remain at the Upper Mines will be adequately reduced following cleanup through a combination of institutional and access controls. However, as with Alternative 1, the reliability of management controls to provide continued protection from remaining hazards at the Upper Mines is only moderate due to the isolated location of the Upper Mines and limited oversight by Park staff. As with Alternative 1, information provided by Townsite staff will help to curtail risky behavior at the Upper Mines.

There is some possibility of recontamination of clean areas due to transport of contaminated materials via runoff and wind. However, the use of a cellular confinement system and slight elevation of the clean trails will help prevent recontamination of surface material from overland (sheet) water flow during rainfall and runoff events. In addition, the proposed ICP will reduce the chance that the cap will be disturbed by Park staff and the proposed monitoring plan will identify any areas that have been recontaminated.

The long-term effectiveness of this alternative is dependent on on-going maintenance at the Upper Mines (i.e., re-covering areas where the cap has been worn down, eroded or disturbed or replacing recontaminated material with clean material), which will require some increased financial burden on IDPR. It is also important for long-term operation and maintenance of the cleanup that Park personnel have an indication of the extent of the clean material. In addition to providing structural stability, a cellular confinement system under the clean gravel cap proposed in this alternative will provide an indication if the imported gravel has been displaced by wind or water.

5.2.2.3 Ability to Meet the Park's Use and Design Needs

Overall, this alternative meets the Park's use and design needs criterion. Alternative 2 proposes the use of log fencing instead of chain-link or some other more impervious fencing. Log fencing meets the original design criterion of maintaining the historic nature of the Upper Mine and is consistent with the preferred fencing at the Townsite. It is also less expensive than chain-link fencing in the short term. However, it is possible that log fencing may not deter some visitors from venturing into restricted areas. This would require IDPR to provide more education of the physical and health hazards that exist at the Upper Mines and more stringent verbal warnings and signage to prevent visitors from accessing areas where these hazards remain.

5.2.2.4 Sustainability

This alternative meets the sustainability criterion as long as operation and maintenance requirements are met. The operation and maintenance activities necessary to sustain the proposed cleanup are the same as those described for Alternative 1 in Section 5.2.1.4, with the exception of establishing and maintaining the vegetative cap on the rail trestle at the Beardsley-Excelsior Mine. The trestle tailings pile will be stabilized using native rock to control tailings erosion into Beardsley Gulch and does not require establishing and maintaining a vegetative cap. Operation and maintenance activities necessary to sustain the cleanup proposed in Alternative 2 are easily implemented.

5.2.2.5 Ease to Implement

Alternative 1 could be readily implemented and would not present any foreseeable technical problems. As with Alternative 1, there are some potential difficulties getting equipment to the Upper Mines on the existing roads and this alternative may require road improvements or the use of smaller trucks. This could result in increased mobilization and construction costs; however, this increased cost would be less than Alternative 1 because Alternative 2 does not require excavation and hauling of contaminated material.

5.2.2.6 Cost

The major costs in this alternative are for clean material, a cellular confinement system, and fencing. Clean material would likely be hauled to the Upper Mines from an off-site location. Operation and maintenance costs would also be substantial for this alternative due to maintenance of the gravel cap although, a cellular confinement system should reduce the displacement of the gravel cap. These costs have not been estimated at this time.

5.2.2.7 Compliance with Applicable Standards

Cleanup activities proposed for Alternative 2 comply with all applicable standards.

5.2.3 Detailed Analysis of Alternative 3

5.2.3.1 Overall Protection of Human Health and the Environment

The No-Action Alternative would fail to protect human health and the environment at the Upper Mines. Current conditions fail to meet the overall protection criteria because contact with existing contamination levels in most areas of the Upper Mines would result in unacceptable risks to Park visitors and staff.

5.2.3.2 Long-term Effectiveness

The No-Action Alternative does not meet this criterion because current risks at the Upper Mines are unacceptable and this alternative proposes no controls to manage current risks at the Upper Mines.

5.2.3.3 Ability to Meet the Park's Use and Design Needs

The No-Action Alternative meets this criterion in that it preserves the native plants and historic structures in the current state of decay, however it does not provide for Park development, visitor access to the Upper Mines, or restoration of historic structures and as a result does not meet the Park's use and design requirements.

5.2.3.4 Sustainability

The No-Action Alternative does not propose any technical components.

5.2.3.5 Ease to Implement

The No-Action Alternative could be implemented immediately and would not present any technical problems.

5.2.3.6 Cost

The No-Action Alternative would involve no cost.

5.2.3.7 Compliance with Applicable Standards

Because no action would be taken to control human exposure pathways and erosion of tailings from the abandoned rail trestle into Beardsley Gulch, this alternative does not comply with applicable human and ecological health standards.

SECTION 6.0 COMPARISON OF CLEANUP ALTERNATIVES

The main differences between Alternative 1 and Alternative 2 are summarized below in Table 6.1.

Table 6.1 Summary of Difference between Alternative 1 and 2

Alternative 1	*Alternative 2*
Cleanup of Roads and Development of Walking Trails	
Excavate and cap with clean material all public areas with soil concentrations equal to or greater than 1,200 mg/kg lead.	Cap trails with a cellular confinement system and clean material all areas with soil concentrations equal to or greater than 1,200 mg/kg lead.
ATV Turn-around and Parking Area Development	
Excavate and cap with clean material all public areas with soil concentrations equal to or greater than 1,200 mg/kg lead.	Cap trails with a cellular confinement system and clean material all areas with soil concentrations equal to or greater than 1,200 mg/kg lead.
Disposal of Contaminated Soil	
Utilize the Slag Pile repository at the Townsite for disposal of contaminated soils excavated from the Upper Mines.	No repository would be required. Soils from fence post holes will be spread out on the trail prior to capping.
Erosion of the Trestle Tailings Pile	
Utilize vegetation, logs and soil wraps with imported fill to stabilize tailings pile.	Utilize native rock to stabilize tailings pile.
Cleanup of Solid and Hazardous Waste	
No difference.	No difference.
Access Restrictions	
Utilize chain-link fencing.	Utilize historic log fencing.
Monitoring and Maintenance of the Remedy	
No difference.	No difference.

Both Alternative 1 and Alternative 2 would adequately reduce the health risks to Park visitors and staff by isolating contaminated soil at both of the Upper Mines from direct human contact. Both alternatives would substantially reduce, and potentially eliminate, significant migration of tailings from the rail trestle ballast to Beardsley Gulch and would satisfy identified environmental protection requirements. In contrast, the No-Action Alternative would not satisfy requirements for adequate protection of human health or the environment as significant lead contamination would still be available for direct human contact and migration. As a result, the No-Action Alternative is dismissed as a viable alternative and is not included in the discussion below.

Cleanup of Road and Development of Walking Trails and ATV Turn-around and Parking Area Development: The main differences between Alternative 1 and Alternative 2 for these two cleanup elements is that Alternative 2 requires no excavation and utilizes a

cellular confinement system to reduce erosion, disturbance and recontamination of the clean gravel cap. Both alternatives protect human health and the environment, meet the Park's use and design needs, and are equally sustainable. However, the long-term effectiveness of Alternative 2 may be slightly greater than Alternative 1 due to the use of a cellular confinement system. In addition, Alternative 2 may be slightly easier and less costly to implement for these cleanup elements because no excavation is required.

Disposal of Contaminated Soil: While Alternative 1 requires disposal of contaminated soils in the Slag Pile repository at the Townsite, Alternative 2 does not require any large scale excavation or disposal of contaminated material. Soils from fence post holes will be spread out on the trail prior to capping. Both alternatives protect human health and the environment, meet the Park's use and design needs, and are equally sustainable and effective in the long term. However, Alternative 2 may be slightly easier and less costly to implement because no disposal is required.

Erosion of the Trestle Tailings Pile: Alternative 1 proposes the use of vegetation, logs and soil wraps with imported fill to stabilize the trestle tailings pile at the Beardsley-Excelsior Mine, while Alternative 1 proposes the use of native rock. Both alternatives adequately protect human health and the environment. However, Alternative 2 better meets the Park's use and design needs in that it is more compatible with the natural environment. The area around the rail trestle at Beardsley-Excelsior Mine is very rocky and has little vegetation cover. As a result, the use of native rock to stabilize the trestle tailings is more consistent with the natural surroundings than the use of a vegetative cover. Further, Alternative 2 is likely to be more effective in the long-term and require less maintenance than Alternative 1. Alternative 2 is easier to implement than the vegetative cover, which must be established and maintained to be effective in controlling erosion. Costs are similar for both alternatives.

Cleanup of Solid and Hazardous Waste: There is no difference between the handling of solid and hazardous waste described in Alternative 1 and Alternative 2.

Access Restrictions: Alternative 2 proposes the use of log fencing instead of chain-link or some other more impervious fencing type to restrict the public from accessing areas where contamination or physical hazards exist. Log fencing meets the original design criterion of maintaining the historic nature of the Upper Mines, is consistent with the preferred fencing for the Townsite, and is less expensive than chain-link in the short term. However, log fencing may not deter some visitors from venturing into restricted areas and will require IDPR to provide a higher level of supervision in the entire Park, as well as more education of the physical and health hazards that exist at the Upper Mines and more stringent verbal warnings and signage to protect visitors from exposure to harmful levels of contaminants.

Monitoring and Maintenance of the Remedy: There is no difference between the monitoring and maintenance of the remedy described in Alternative 1 and Alternative 2, with the exception of maintaining the vegetative cover on the rail trestle proposed in Alternative 1. The erosion control measures proposed in Alternative 1 would not be

effective if the vegetative cover was disturbed, stressed or diminished and may require more maintenance compared to Alternative 2.

Cost: Overall, the cleanup proposed in Alternative 2 would be less costly than Alternative 1 due to the reduced costs associated with the excavation, hauling and disposal of contaminated material.

In summary, both alternatives would adequately protect human health and the environment. Although Alternative 2 is the preferred alternative because aspects of the cleanup are more effective in the long term, more sustainable, easier to implement, and better meet the Park's use and design needs. In addition, this alternative is less costly to implement because it requires no excavation, hauling or disposal of contaminated material. The No-Action Alternative is feasible, but would not be compatible with the land use goals for the Upper Mines.

SECTION 7.0 PREFERRED ALTERNATIVE STATEMENT OF WORK

Alternative 2 described above has been selected as the most feasible alternative in meeting IDPR's anticipated use goals of the Beardsley-Excelsior and Pacific Mines and is proposed as the cleanup plan for the Upper Mines. The statement of work for Alternative 2, including design details, completion milestones, and detailed cost estimates, is described below.

7.1 Construction Materials and Design Details

Construction materials for the cleanup of the Beardsley-Excelsior and Pacific Mines are readily available in the Challis area. Table 7.1 summarizes the construction materials required for the Preferred Alternative.

Table 7.1 Required Construction Materials for Preferred Alternative

Cleanup Elements	Construction Materials Required
Cleanup of Roads and Development of Walking Trails	Geotextile fabric underlayment, subgrade reinforcement (e.g., a cellular confinement system for road base aggregate), clean aggregate material, clean trail surface material
ATV Turn-around and Parking Area Development	Geotextile fabric underlayment, subgrade reinforcement (e.g., a cellular confinement system for road base aggregate), clean aggregate material, clean trail surface material
Disposal of Contaminated Soil	Not required. Soils from fence post holes will be spread out on the trail prior to capping.
Erosion of the Trestle Tailings Pile	Native Rock, geotextile fabric underlayment, clean fine grade aggregate material cushion layer.
Cleanup of Solid and Hazardous Waste	None
Access Restrictions	Fencing
Monitoring and Maintenance of the Remedy	None

7.1.1 Cleanup of Roads and Development of Walking Trails and ATV Turn-around and Parking Areas

Walking trails and ATV turn-around and parking areas with lead concentrations higher than 1,200 mg/kg will be covered with a layer system composed of a geotextile fabric, a cellular confinement system, and 12 inches of clean material. The road and trail sections requiring remediation in this manner are a small portion of the proposed Beardsley-Excelsior Mine walking trail, all the proposed walking trails at the Pacific Mine (Upper Pacific), and the entire ATV parking/turn-around area at the Pacific Mine (Upper Pacific). A small area of trail near the tailings dump at the Lower Pacific will be covered with 6" of clean trail cover and fenced to restrict the public from accessing the area (Figure C6 in Appendix B shows this area).

Approximate area of the trail system to be remediated: 1,600 square yards (SY)
Approximate area of subgrade reinforcement: 14,500 square feet (SF)
Approximate volume of imported clean material: 550 cubic yards (CY)

7.1.2 Disposal of Contaminated Soil

No contaminated soils or materials will be removed from the Beardsley-Excelsior and Pacific Mines for this alternative and, as result, no disposal is required. However, soils from fence post holes will be spread out on the trail prior to capping.

7.1.3 Erosion of the Trestle Tailings Pile

Native rock (rip rap) will be used to stabilize the abandoned rail trestle at the Beardsley-Excelsior Mine to control tailings erosion and migration into Beardsley Gulch during spring runoff. Native rock will be placed along the toe of the tailings that support the trestle. The rock will be placed approximately 6 feet high for a length of approximately 180 feet.

7.1.4 Cleanup of Solid and Hazardous Wastes

The Pacific and Beardsley-Excelsior Mines are littered with various forms of solid and potentially hazardous waste. Solid and hazardous wastes will be collected, packaged and removed to an appropriate disposal facility. Any pieces of historical mining waste such as old equipment or metal objects that do not pose a threat to human health or the environment may be left on-site.

7.1.5 Access Restrictions

Many of the cleanup elements require fencing to restrict the public from accessing contaminated areas. Either Buck and Pole or Post and Rail fences are recommended for their historic appearance, relative low cost, and because the fencing can be constructed to discourage people from climbing through or over the barricade. Other fencing types may also be used to protect select areas from unauthorized entry.

Approximate total linear feet (LF) of fencing: 4,800 LF

7.1.6 Monitoring and Maintenance of the Remedy

IDPR will develop a long-term sampling, monitoring, and response program in conjunction with the final design. Consideration will be given to reduction of potential recontamination in all final design elements.

7.2 Completion Milestones

Completion milestones and target completion dates for the Upper Mines cleanup are the same as those described in Section 7.2 of the Final Workplan (TerraGraphics 2007a). However, construction is set to begin after the final approval of this amendment. Table 7.2 from the Final Workplan (TerraGraphics 2007a) is shown below and lists the completion milestones and target completion dates for the cleanup.

Table 7.2 Upper Mines Cleanup Completion Milestones

Completion Milestones	Target Completion Dates
90% Design Final/Bid Package for the Upper Mines	Concurrent with development of the Workplan Amendment
Notice to Proceed/Start Construction	As soon as the weather permits following Final approval of the Workplan Amendment
Construction Phase Progress Reports	8 and 16 weeks from start of construction
Complete Construction	26 weeks from start of construction
Complete and Implement Long-term Monitoring Plan	Prior to opening to the Public
Complete Institutional Controls Plan	Following completion of construction
Completion Report Final	8-12 weeks from construction completion

7.2.1 90% Design Final

See Section 7.2.1 of the Final Workplan (TerraGraphics 2007a) for a description of the 90% Design milestone.

Completion of the 90% Design and Bid Package for the Upper Mines cleanup is projected to occur concurrently with development of this amendment to the Final Workplan (TerraGraphics 2007a).

7.2.2 Notice to Proceed/Start Construction

See Section 7.2.2 of the Final Workplan for a description of the Notice to Proceed/Start Construction milestone. Construction is projected to occur as soon as the weather permits following final approval of this amendment.

7.2.3 Construction Phase

A three-phase construction schedule is proposed for the Townsite cleanup in Section 7.3 of the Final Workplan (TerraGraphics 2007a). Phase 1 provides for construction of the proposed Main Access Bridge (or a temporary access bridge) to allow equipment to access the Townsite and Upper Mines. In Phase 2, all excavation at the Townsite will be completed and excavated material will be placed on the Slag Pile before it is capped with asphalt in Phase 3. Cleanup of the Upper Mines will be completed during Phase 2. Completion of all the construction phase elements shown below is required to reach the construction completion milestone. See Section 7.2.3 of the Final Workplan (TerraGraphics 2007a) for a more detailed description of the construction phase milestone for the Townsite cleanup.

Two Progress Reports will be submitted to IDEQ during the construction phase (at around 8 and 16 weeks from the start of the construction phase).

Construction at the Townsite and the Upper Mines is projected to be completed 26 weeks from start of construction.

7.2.4 Complete and Implement Long-term Monitoring Plan

A workplan will be developed for in-stream sampling, soil sampling, dry well sampling, and visual observations at the Townsite and the Upper Mines prior to opening to the public. Sampling will be conducted by IDPR and results will be reported to IDEQ.

7.2.5 Complete Institutional Controls Plan

An ICP will be developed following completion of construction. This plan will include minimum operations and maintenance guidance and institutional control protocols to ensure that IDPR and other activities at the Townsite and the Upper Mines do not contribute to recontamination of remediated areas. The plan will also outline land-use restrictions to be adopted at the Townsite and the Upper Mines.

7.2.6 Construction Completion Report Final

Once construction is completed, a Construction Completion Report will be completed and submitted to IDEQ for review.

The Construction Completion Report is projected to be finalized 8-12 weeks after construction has been completed at the Townsite and the Upper Mines.

7.2.7 Construction Oversight

A resident project representative with construction oversight experience will observe progress and quality of the construction and cleanup at the Townsite and the Upper Mines. The resident project representative will be onsite periodically throughout construction (i.e., 3 days/week for 5 weeks during bridge installation, 3 days/week for 4 weeks during site grading and excavation, and 5 days/week for 4 weeks during site closure). The resident project representative will track construction progress, act as a liaison between the engineer and the construction contractor, observe the quality of construction, complete daily logs, provide the engineer with periodic progress reports, and perform clean soil quality assurance testing. Clean soil quality assurance testing will be completed in accordance with the Townsite QAPP (TerraGraphics 2007b). See Section 7.2.7 of the Final Workplan (TerraGraphics 2007a) for a more detailed description of the resident project representative's role and responsibilities during construction oversight.

7.2.8 Construction Timeline Uncertainties

There are several uncertainties that could cause delays in the proposed timeline. These uncertainties are outlined in Section 7.2.8 of the Final Workplan (TerraGraphics 2007a).

7.3 Cost Estimates

Pre-design cost opinions for completion of the Upper Mines cleanup in a single construction year are shown in Table 7.4 below. These are feasibility level pre-design estimates (+/-50%) and are subject to a number of uncertainties. Actual costs will depend on the final selected design, material costs, local conditions and other factors.

Table 7.4 Pre-design Cost Opinions – Single Construction Year

Material and Construction Costs				
	UNIT	**QTY**	**UNIT PRICE**	
Beardsley-Excelsior Riprap - Tressel Area				*$11,467*
D50 18" rip rap	CY	135	85	$11,467
Beardsley-Excelsior View Area Construction				*$5,913*
Prepare and Roll Subgraded	SY	264	1	$264
Shoulder Material	CY	9	25	$218
Geotextile fabric	SY	263	1	$316
Geoweb	SF	2162	1	$2,162
Geoweb Fill	CY	59	28	$1,638
Cover Material	CY	29	45	$1,316
Beardsley-Excelsior Post & Pole Fencing and Gates				*$34,684*
Fencing	LF	2504	13	$33,684
Gates	EA	1	500	$500
Pedestrian walk - thru	EA	1	500	$500
Upper Pacific Trail Area Construction				*$32,895*
Prepare and Roll Subgrade	SY	1370	1	$1,370
Shoulder Material	CY	87	25	$2,175
Geotextile fabric	SY	1370	1	$1,644
Geoweb	SF	12331	1	$12,331
Geoweb Fill	CY	305	28	$8,526
Cover Material	CY	152	45	$6,849
Upper Pacific Post & Pole Fencing and Gates				*$27,323*
Fencing	LF	1957	13	$26,323
Pedestrian walk - thru w/gate	EA	1	1000	$1,000
Lower Pacific Post & Pole Fencing and Gates				*$2,465*
Fencing	LF	379	13	$2,465
Total Material and Construction Costs				***$114,747***
Other Costs				
Additional Construction Costs				*$42,119*
Mob/Demob			5%	$5,737
Site and Dust Controls			8%	$9,180
Worker Safety Measures			1%	$1,147
Signage/Traffic Control			$400	$400
Contingency			15%	$17,212
Survey and Staking			3%	$3,442
As Built Drawing			$5,000	$5,000
Total Additonal Construction Costs				***$42,119***
Engineering & Construction Services				*$42,129*
Design			10%	$11,475
Bidding Phase Services			3%	$3,442
Permitting Support			3%	$3,442
Construction Oversight			12%	$13,770
Engr Support during Construction			$10,000	$10,000
Total Engineering Services Costs				***$42,129***
Total Cleanup Costs				**$198,995**

It is assumed that if IDPR is not able to accomplish the entire cleanup during a single fiscal year, a multi-year phased approach to the cleanup would be accomplished. This multi-year phased approach would cost approximately an additional 15%.

7.4 Health and Safety Plan

Cleanup contractors will be required to demonstrate compliance with the Code of Federal Regulations (29 CFR 1910.120) by submittal of a Health and Safety Plan for the scope of work at least seven days prior to commencing work at the site. Section 7.4 of the Final

Workplan (TerraGraphics 2007a) describes health and safety requirements for cleanup contractors and employees at the Townsite. These same requirements apply to cleanup contractors and employees engaged in work at the Upper Mines.

7.5 Community Involvement Plan

IDPR has already conducted extensive community outreach that will be followed with activities described in the project Community Involvement Plan (CIP) that has been developed for the Bayhorse Townsite and the Upper Mines. The CIP can be found in Appendix A of the Final Workplan (TerraGraphics 2007a).

SECTION 8.0 REFERENCES

Idaho Department of Environmental Quality (IDEQ). 2003a. Beardsley-Excelsior Mine Preliminary Assessment Report, Custer County, Idaho. October.

IDEQ 2003b. Beardsley-Excelsior Mine Preliminary Assessment Report, Custer County, Idaho. October.

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TerraGraphics. 2005b. Final Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) for the 2005 Property Sampling in the Coeur d'Alene River Basin of Idaho. Prepared for the Idaho Department of Environmental Quality.

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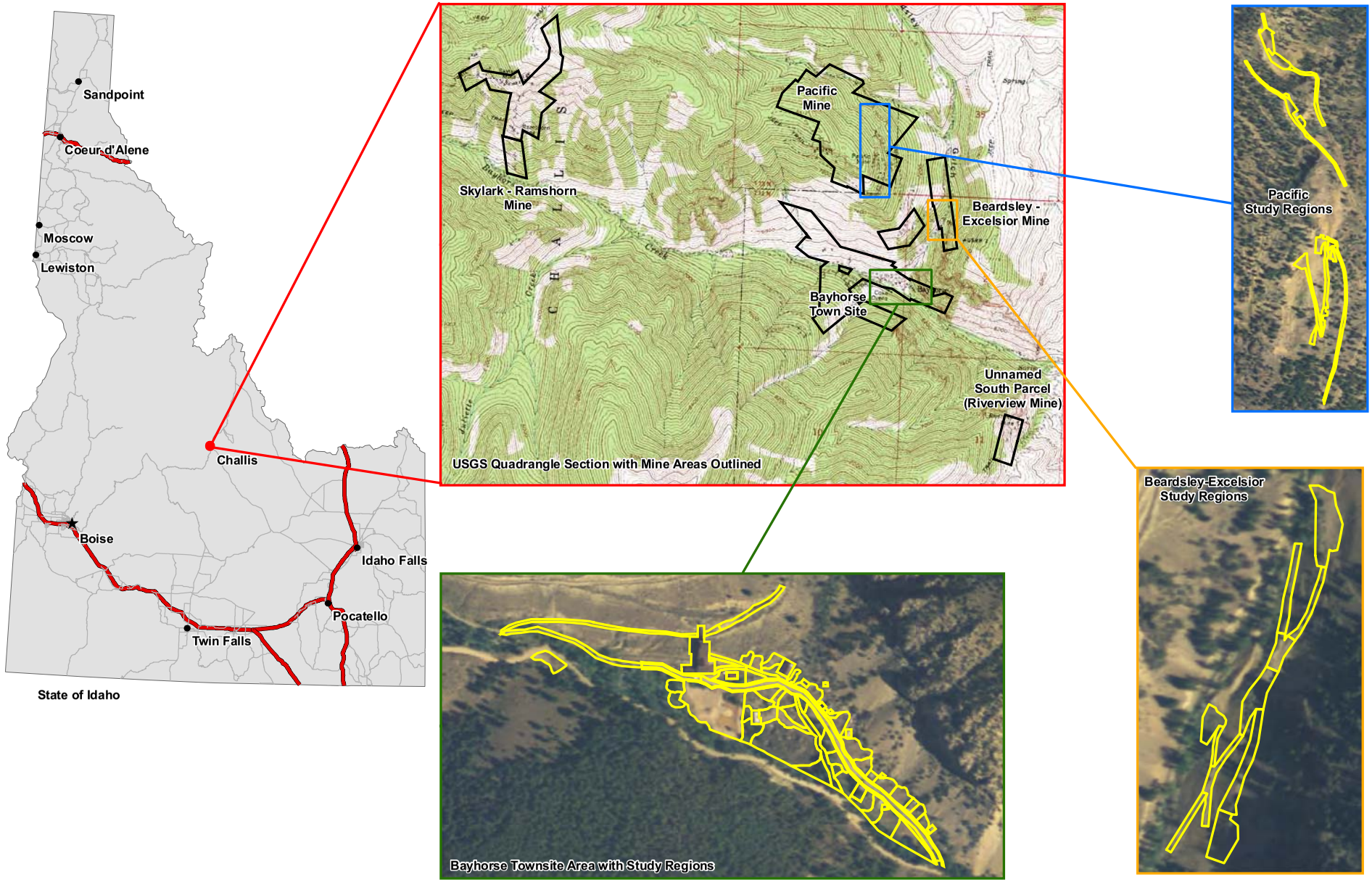
TerraGraphics. 2006a. Addendum to Bayhorse Site Risk Assessment and Proposed Risk Management Plan: Upper Mines Risk Management Plan. Prepared for the Idaho Department of Parks and Recreation and Idaho Department of Environmental Quality.

TerraGraphics. 2006b. Phase I Environmental Site Assessment and All Appropriate Inquiry, Bayhorse Mine Site Near Challis, Idaho. Prepared for the Idaho Department of Parks and Recreation and Idaho Department of Environmental Quality.

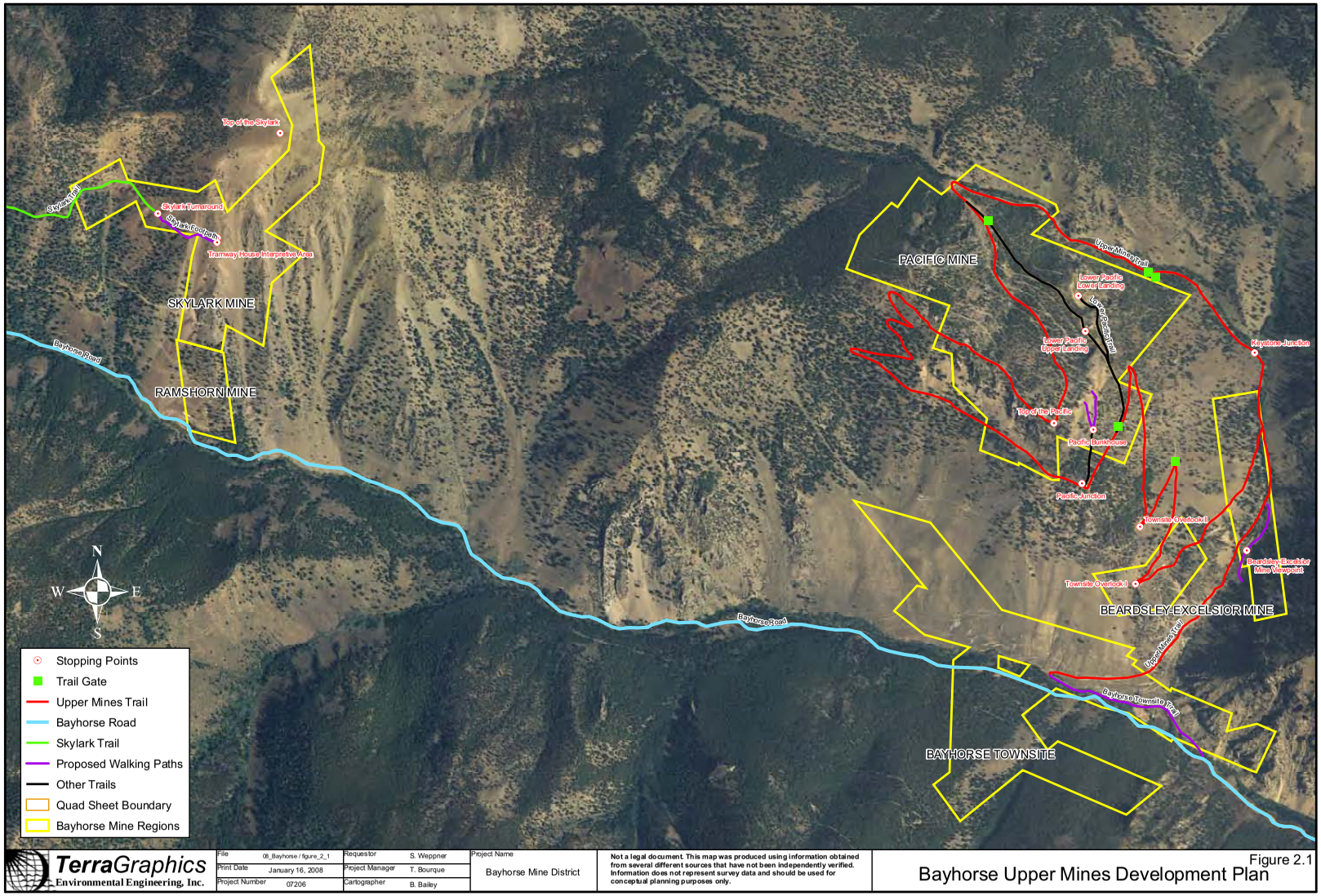
TerraGraphics. 2007a. Final Workplan and Analysis of Brownfields Cleanup Alternatives for the Bayhorse Townsite. Prepared for the Idaho Department of Parks and Recreation and Idaho Department of Environmental Quality.

TerraGraphics. 2007b. Quality Assurance Project Plan (QAPP) for the Brownfields Cleanup at the Bayhorse Townsite, Challis, Idaho. Prepared for the Idaho Department of Parks and Recreation and Idaho Department of Environmental Quality.

Appendix A



TerraGraphics Environmental Engineering, Inc.	File: 08_Bayhorse / figure_1_1	Requestor: S. Weppner	Project Name: Bayhorse Pacific and Beardsley	Not a legal document. This map was produced using information obtained from several different sources that have not been independently verified. Information does not represent survey data and should be used for conceptual planning purposes only.	Project Site Location Map
	Print Date: January 16, 2008	Project Manager: Tom Bourque			Figure 1.1
	Project Number: 07206	Cartographer: B. Bailey			



TerraGraphics Environmental Engineering, Inc.

File	08_Bayhorse / figure_2_1	Requestor	S. Weppner
Print Date	January 16, 2008	Project Manager	T. Bourque
Project Number	07206	Cartographer	B. Bailey

Project Name: Bayhorse Mine District

Not a legal document. This map was produced using information obtained from several different sources that have not been independently verified. Information does not represent survey data and should be used for conceptual planning purposes only.

Figure 2.1
Bayhorse Upper Mines Development Plan

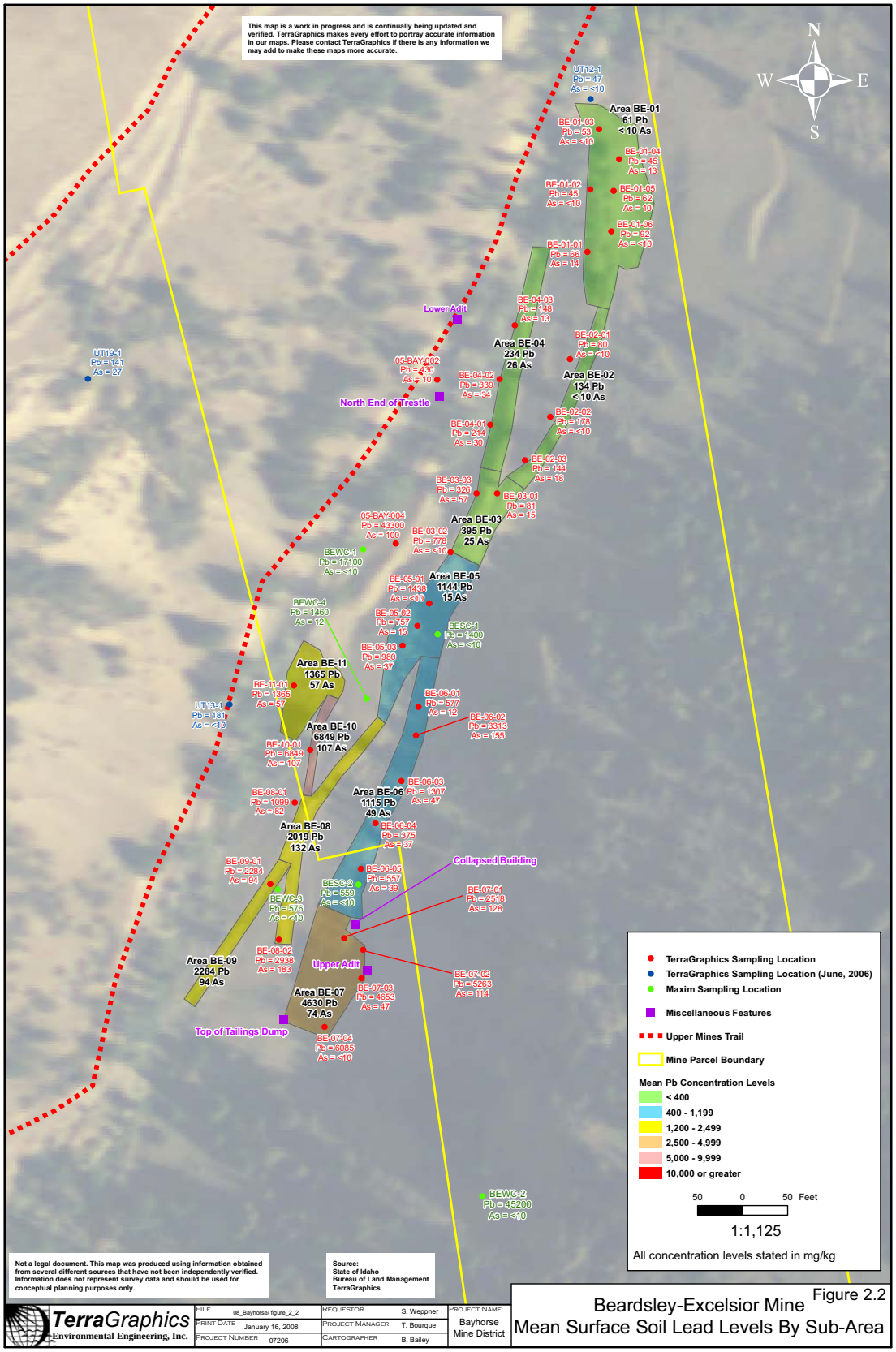
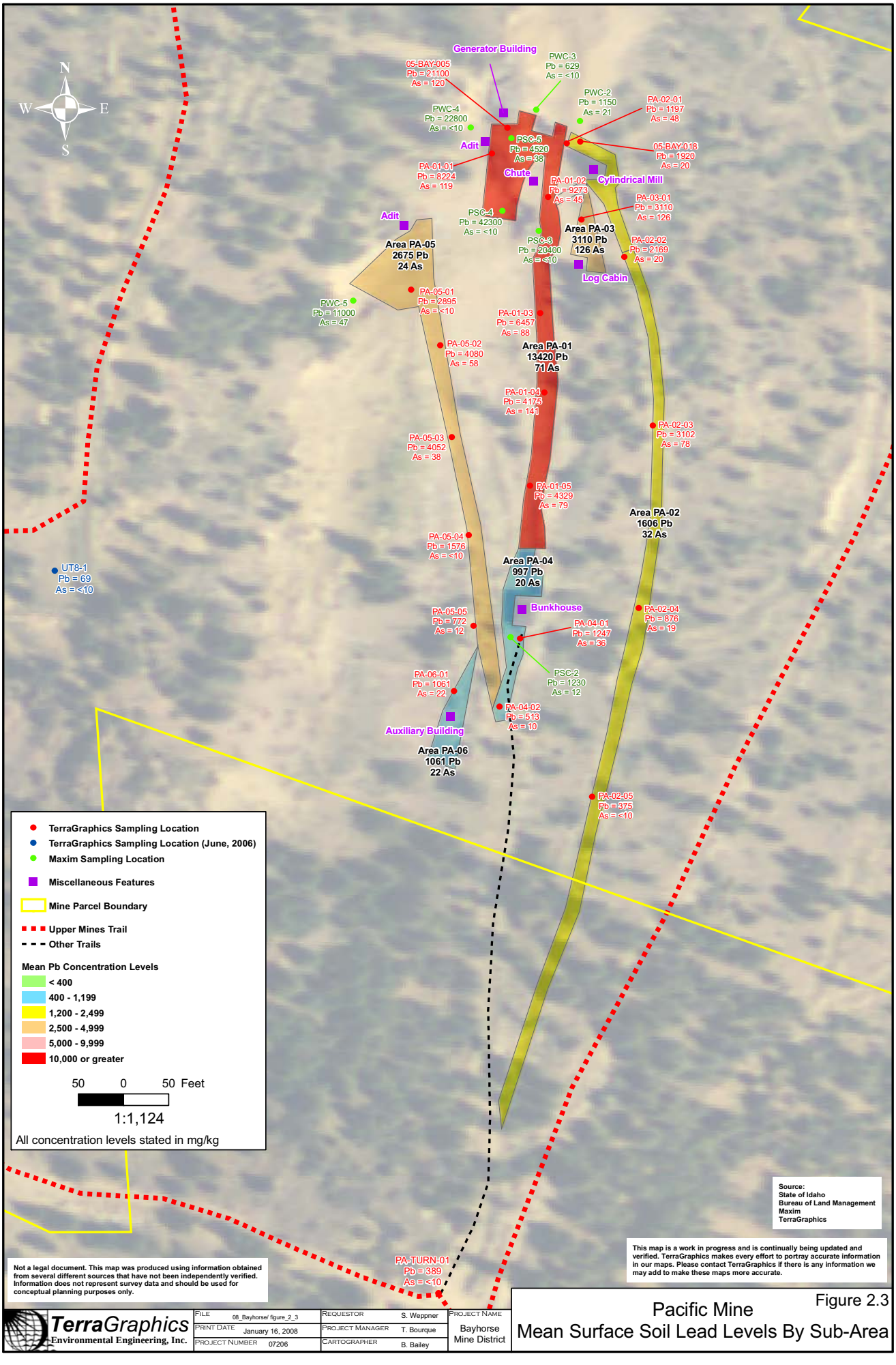


Figure 2.2
Beardsley-Excelsior Mine
Mean Surface Soil Lead Levels By Sub-Area

TerraGraphics Environmental Engineering, Inc.	File: 08_Bayhorse/ figure_2_2	Requestor: S. Weppner	Project Name: Bayhorse Mine District
	Print Date: January 16, 2008	Project Manager: T. Bourque	
	Project Number: 07206	Cartographer: B. Bailey	



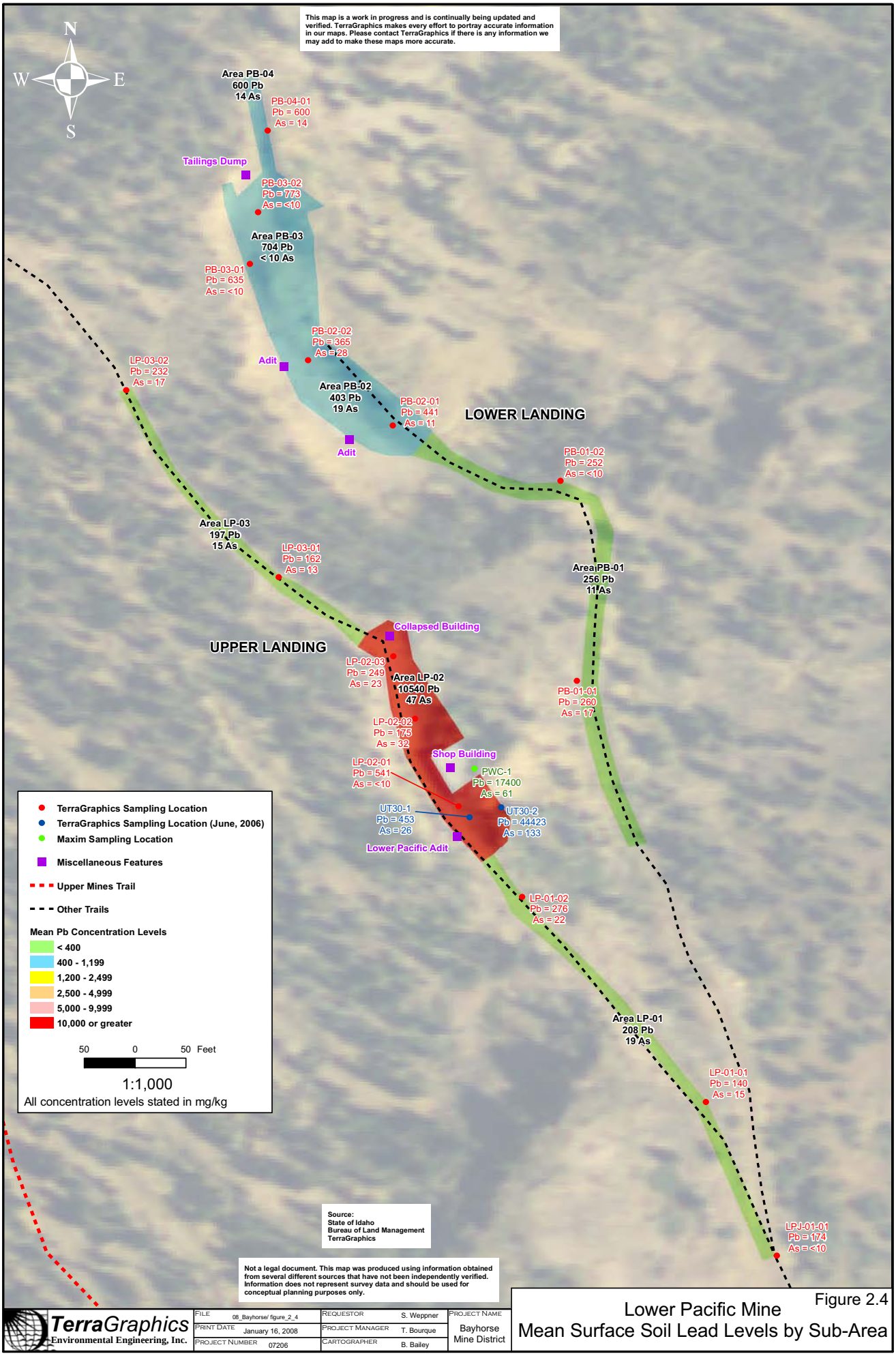
TerraGraphics
Environmental Engineering, Inc.

File	08_Bayhorse/ figure_2_3	Requestor	S. Weppner
Print Date	January 16, 2008	Project Manager	T. Bourque
Project Number	07206	Cartographer	B. Bailey

Project Name: Bayhorse Mine District

Figure 2.3

Pacific Mine
Mean Surface Soil Lead Levels By Sub-Area



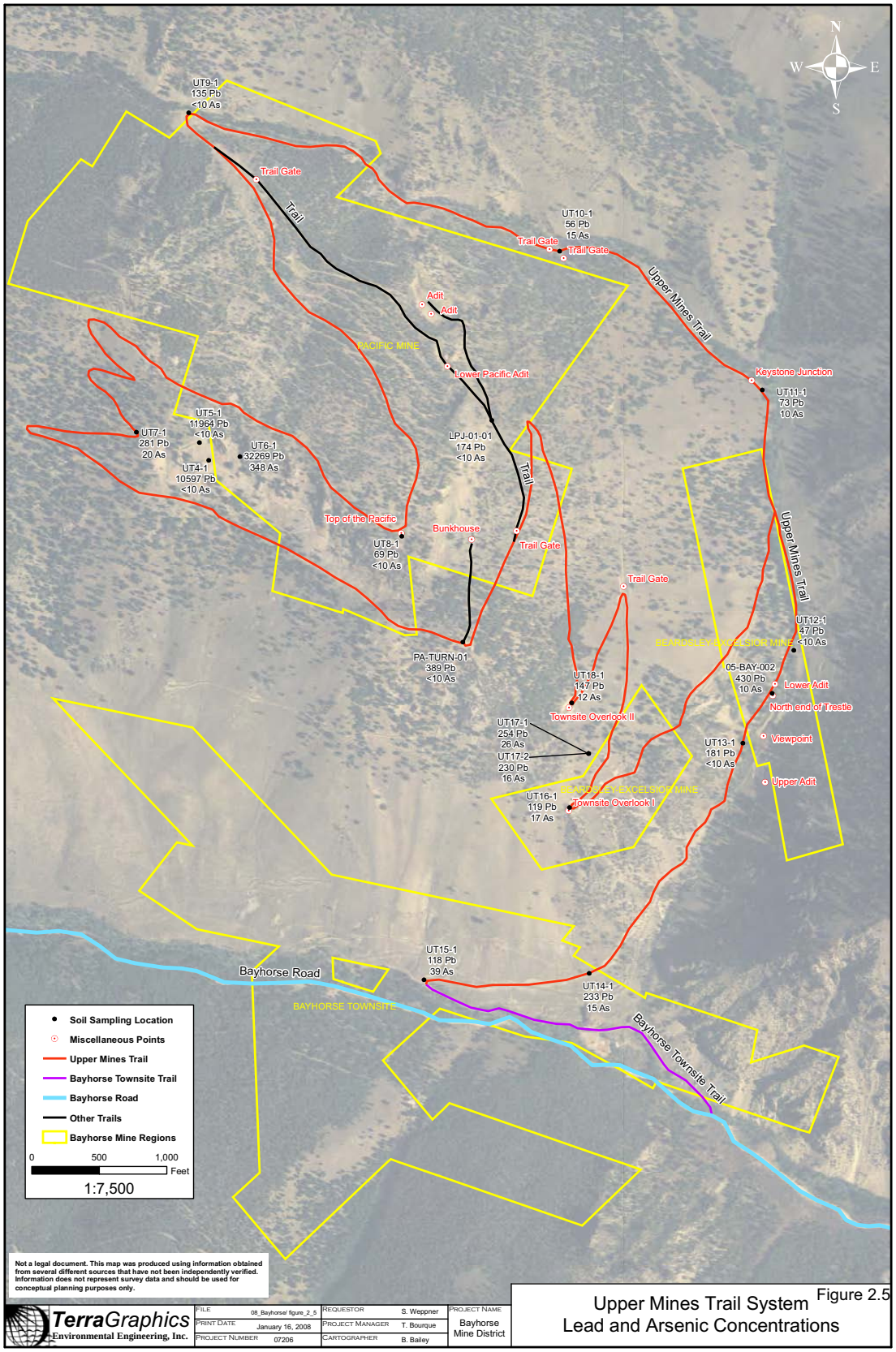
TerraGraphics
Environmental Engineering, Inc.

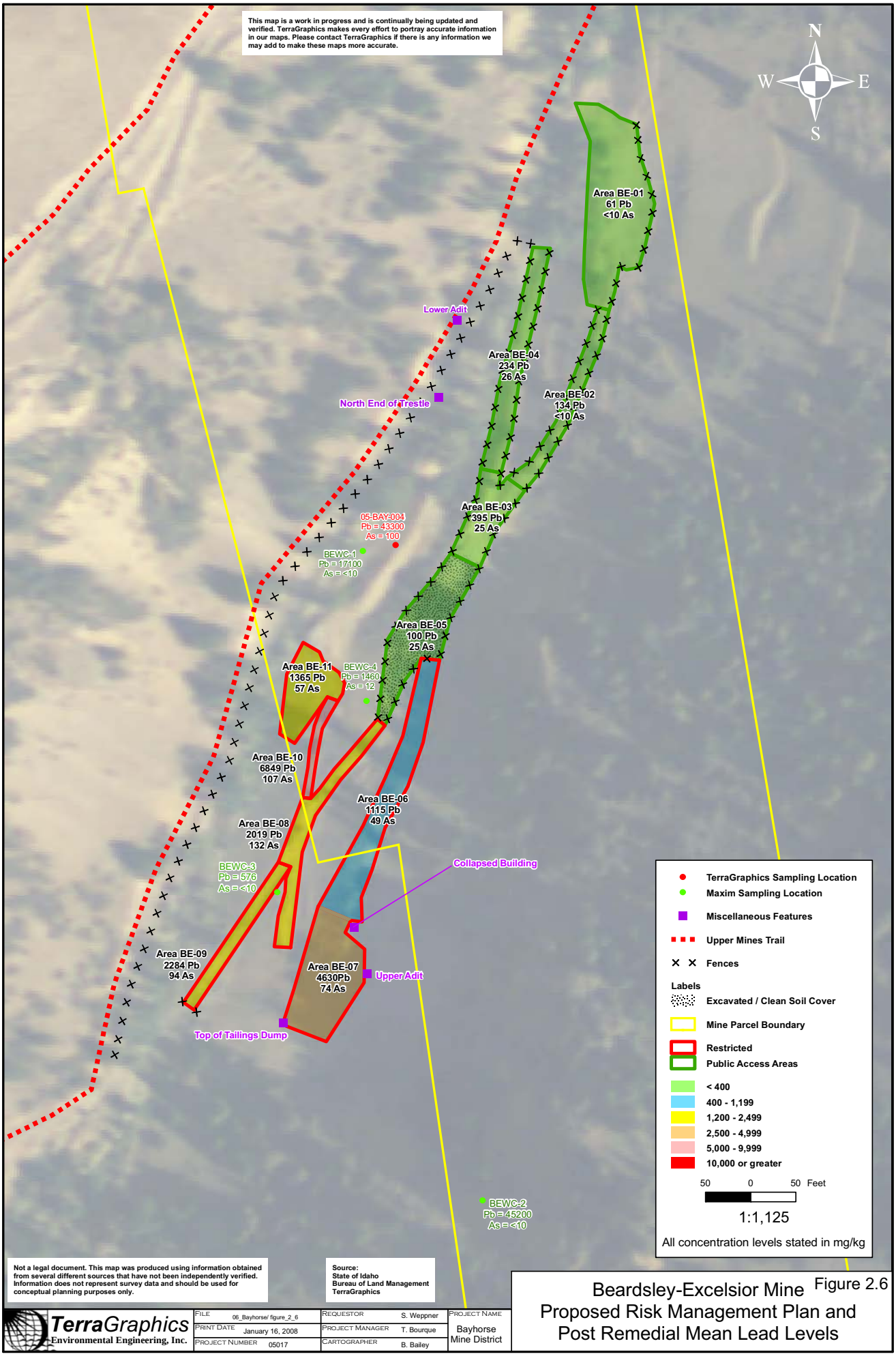
File	08_Bayhorse/ figure_2_4	Requestor	S. Weppner
Print Date	January 16, 2008	Project Manager	T. Bourque
Project Number	07206	Cartographer	B. Bailey

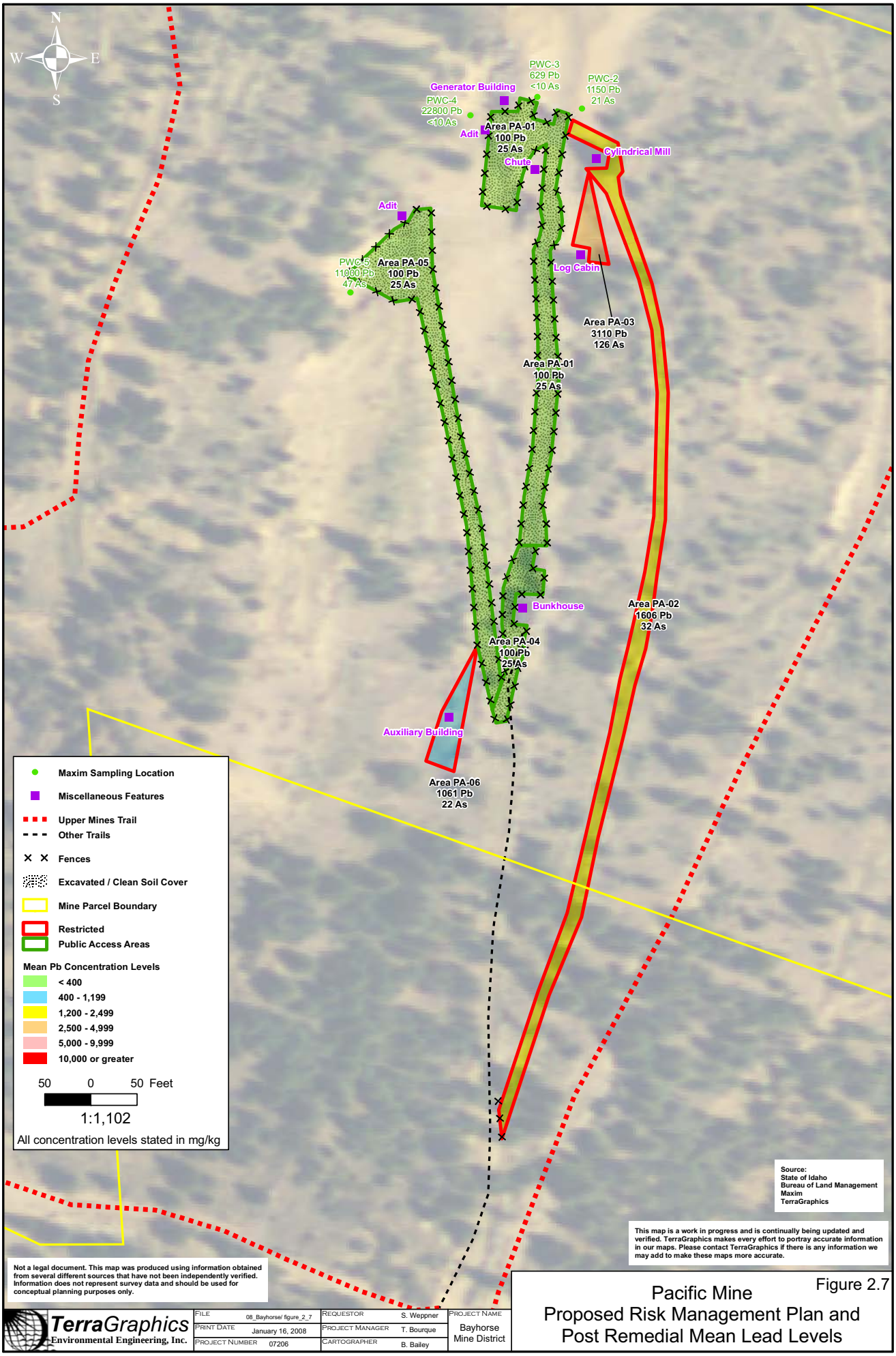
Project Name: Bayhorse Mine District

Figure 2.4

Lower Pacific Mine
Mean Surface Soil Lead Levels by Sub-Area


N
W
E
S
UT9-1
135 Pb
<10 As
Trail Gate
Trail
UT10-1
56 Pb
15 As
Trail Gate
Trail Gate
Upper Mines Trail
Adit
Adit
PACIFIC MINE
Lower Pacific Adit
Keystone Junction
UT11-1
73 Pb
10 As
UT5-1
11964 Pb
<10 As
UT7-1
281 Pb
20 As
UT6-1
32269 Pb
348 As
UT4-1
10597 Pb
<10 As
LPJ-01-01
174 Pb
<10 As
Trail
Top of the Pacific
Bunkhouse
UT8-1
69 Pb
<10 As
Trail Gate
Trail Gate
Upper Mines Trail
UT12-1
47 Pb
<10 As
BEARMORE EXPANDED IRON MINE
PA-TURN-01
389 Pb
<10 As
05-BAY-002
430 Pb
10 As
Lower Adit
North end of Trestle
UT18-1
147 Pb
12 As
Townsite Overlook II
UT17-1
254 Pb
26 As
UT17-2
230 Pb
16 As
UT13-1
181 Pb
<10 As
Viewpoint
Upper Adit
BEARMORE EXCELSIOR MINE
UT16-1
119 Pb
17 As
Townsite Overlook I
UT15-1
118 Pb
39 As
Bayhorse Road
UT14-1
233 Pb
15 As
BAYHORSE TOWNSITE
Bayhorse Townsite Trail
Soil Sampling Location
Miscellaneous Points
Upper Mines Trail
Bayhorse Townsite Trail
Bayhorse Road
Other Trails
Bayhorse Mine Regions
0
500
1,000
Feet
1:7,500
Not a legal document. This map was produced using information obtained from several different sources that have not been independently verified. Information does not represent survey data and should be used for conceptual planning purposes only.
TerraGraphics
Environmental Engineering, Inc.
FILE 08_Bayhorse\ figure_2_5
PRINT DATE January 16, 2008
PROJECT NUMBER 07206
REQUESTOR S. Weppner
PROJECT MANAGER T. Bourque
CARTOGRAPHER B. Bailey
PROJECT NAME Bayhorse Mine District
Upper Mines Trail System
Lead and Arsenic Concentrations
Figure 2.5


This map is a work in progress and is continually being updated and verified. TerraGraphics makes every effort to portray accurate information in our maps. Please contact TerraGraphics if there is any information we may add to make these maps more accurate.
N
W
E
S
Area BE-01
61 Pb
<10 As
Lower Adit
Area BE-04
234 Pb
26 As
North End of Trestle
Area BE-02
134 Pb
<10 As
Area BE-03
395 Pb
25 As
05-BAY-004
Pb = 43300
As = 100
BEWC-1
Pb = 17100
As = <10
Area BE-05
100 Pb
25 As
Area BE-11
1365 Pb
57 As
BEWC-4
Pb = 1460
As = 12
Area BE-10
6849 Pb
107 As
Area BE-06
1115 Pb
49 As
Area BE-08
2019 Pb
132 As
BEWC-3
Pb = 576
As = <10
Collapsed Building
Area BE-09
2284 Pb
94 As
Area BE-07
4630Pb
74 As
Upper Adit
Top of Tailings Dump
BEWC-2
Pb = 45200
As = <10
TerraGraphics Sampling Location
Maxim Sampling Location
Miscellaneous Features
Upper Mines Trail
Fences
Labels
Excavated / Clean Soil Cover
Mine Parcel Boundary
Restricted
Public Access Areas
< 400
400 - 1,199
1,200 - 2,499
2,500 - 4,999
5,000 - 9,999
10,000 or greater
50 0 50 Feet
1:1,125
All concentration levels stated in mg/kg
Not a legal document. This map was produced using information obtained from several different sources that have not been independently verified. Information does not represent survey data and should be used for conceptual planning purposes only.
Source:
State of Idaho
Bureau of Land Management
TerraGraphics
TerraGraphics
Environmental Engineering, Inc.
File 06_Bayhorse/ figure_2_6
Print Date January 16, 2008
Project Number 05017
Requestor S. Weppner
Project Manager T. Bourque
Cartographer B. Bailey
Project Name
Bayhorse
Mine District
Beardsley-Excelsior Mine
Proposed Risk Management Plan and
Post Remedial Mean Lead Levels
Figure 2.6


N
W
E
S
PWC-3
629 Pb
<10 As
PWC-2
1150 Pb
21 As
Generator Building
PWC-4
22800 Pb
<10 As
Adit
Area PA-01
100 Pb
25 As
Chute
Cylindrical Mill
Adit
PWC-5
11000 Pb
47 As
Area PA-05
100 Pb
25 As
Log Cabin
Area PA-03
3110 Pb
126 As
Area PA-01
100 Pb
25 As
Bunkhouse
Area PA-02
1606 Pb
32 As
Area PA-04
100 Pb
25 As
Auxiliary Building
Area PA-06
1061 Pb
22 As
Maxim Sampling Location
Miscellaneous Features
Upper Mines Trail
Other Trails
Fences
Excavated / Clean Soil Cover
Mine Parcel Boundary
Restricted
Public Access Areas
Mean Pb Concentration Levels
< 400
400 - 1,199
1,200 - 2,499
2,500 - 4,999
5,000 - 9,999
10,000 or greater
50 0 50 Feet
1:1,102
All concentration levels stated in mg/kg
Source:
State of Idaho
Bureau of Land Management
Maxim
TerraGraphics
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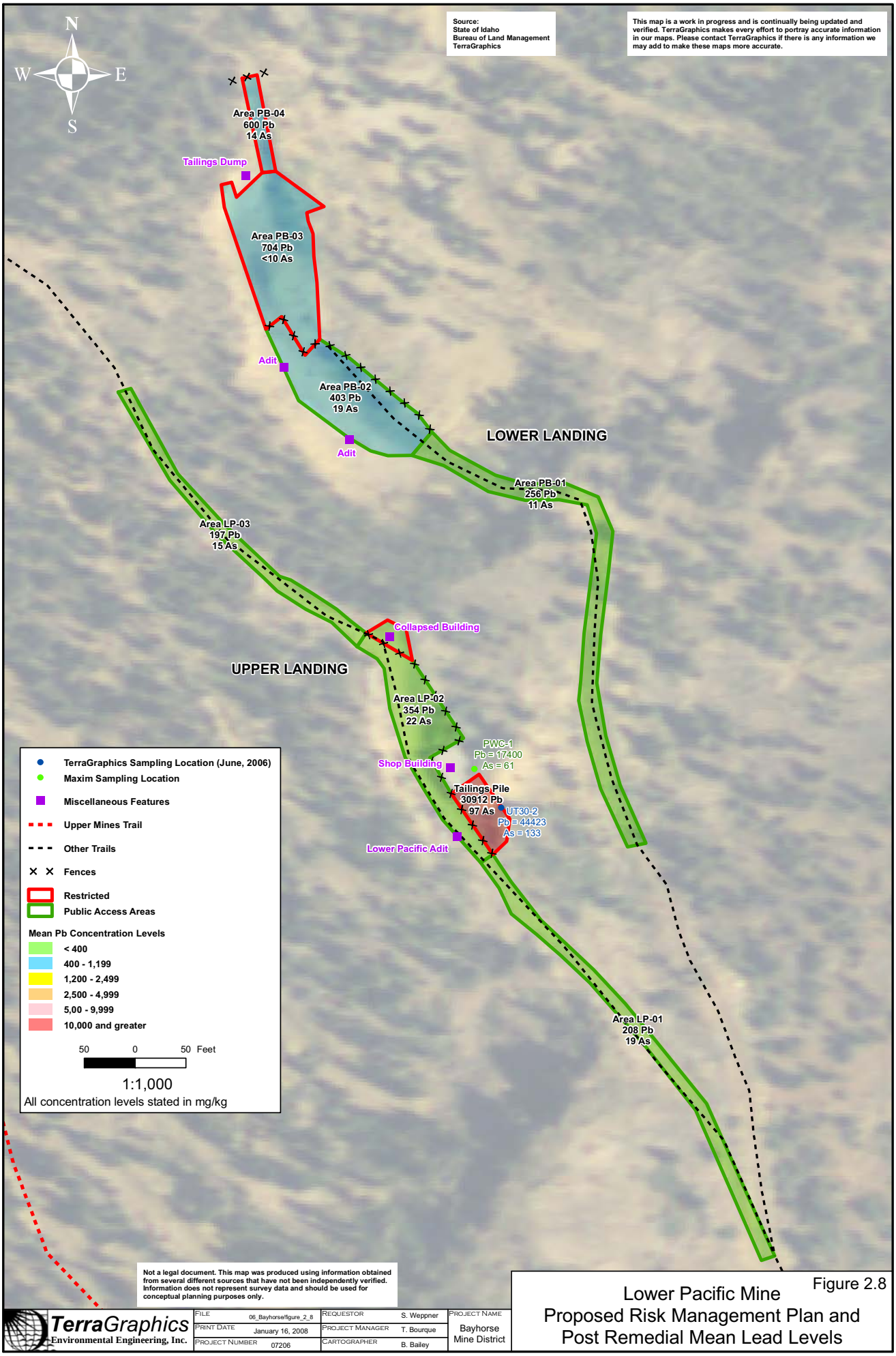
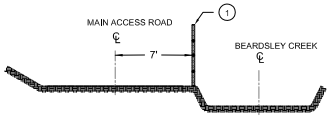
Not a legal document. This map was produced using information obtained from several different sources that have not been independently verified. Information does not represent survey data and should be used for conceptual planning purposes only.
TerraGraphics
Environmental Engineering, Inc.
File 08_Bayhorse/ figure_2_7
Print Date January 16, 2008
Project Number 07206
Requestor S. Weppner
Project Manager T. Bourque
Cartographer B. Bailey
Project Name
Bayhorse
Mine District
Figure 2.7
Pacific Mine
Proposed Risk Management Plan and
Post Remedial Mean Lead Levels

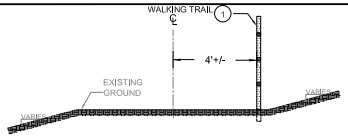

N
W
E
S
Source:
State of Idaho
Bureau of Land Management
TerraGraphics
This map is a work in progress and is continually being updated and verified. TerraGraphics makes every effort to portray accurate information in our maps. Please contact TerraGraphics if there is any information we may add to make these maps more accurate.
Area PB-04
600 Pb
14 As
Tailings Dump
Area PB-03
704 Pb
<10 As
Adit
Area PB-02
403 Pb
19 As
Adit
LOWER LANDING
Area PB-01
256 Pb
11 As
Area LP-03
197 Pb
15 As
Collapsed Building
UPPER LANDING
Area LP-02
354 Pb
22 As
PWC-1
Pb = 17400
As = 61
Shop Building
Tailings Pile
30912 Pb
97 As
UT30-2
Pb = 44423
As = 133
Lower Pacific Adit
Area LP-01
208 Pb
19 As
TerraGraphics Sampling Location (June, 2006)
Maxim Sampling Location
Miscellaneous Features
Upper Mines Trail
Other Trails
Fences
Restricted
Public Access Areas
Mean Pb Concentration Levels
< 400
400 - 1,199
1,200 - 2,499
2,500 - 4,999
5,00 - 9,999
10,000 and greater
50 0 50 Feet
1:1,000
All concentration levels stated in mg/kg
Not a legal document. This map was produced using information obtained from several different sources that have not been independently verified. Information does not represent survey data and should be used for conceptual planning purposes only.
TerraGraphics
Environmental Engineering, Inc.
File 06_Bayhorse\figure_2_8
Print Date January 16, 2008
Project Number 07206
Requestor S. Weppner
Project Manager T. Bourque
Cartographer B. Bailey
Project Name
Bayhorse
Mine District
Figure 2.8
Lower Pacific Mine
Proposed Risk Management Plan and
Post Remedial Mean Lead Levels

Appendix B



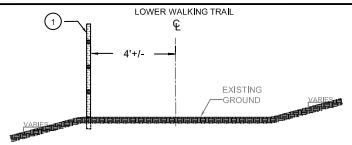
1. PROPOSED THREE RAIL POST-AND-POLE FENCE

1 TYPICAL FENCE PLACEMENT ON MAIN ACCESS ROAD
NTS



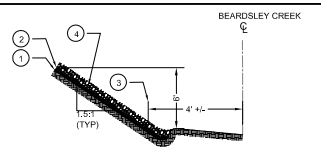
1. POST-AND-POLE FENCE. INSTALL APPROXIMATELY 4 FEET FROM CENTERLINE OF EXISTING TRAIL ON UPHILL SIDE ALONG TOE OF SLOPE

2 TYPICAL TRAIL SECTION FROM PARKING AREA TO VIEWING AREA
NTS



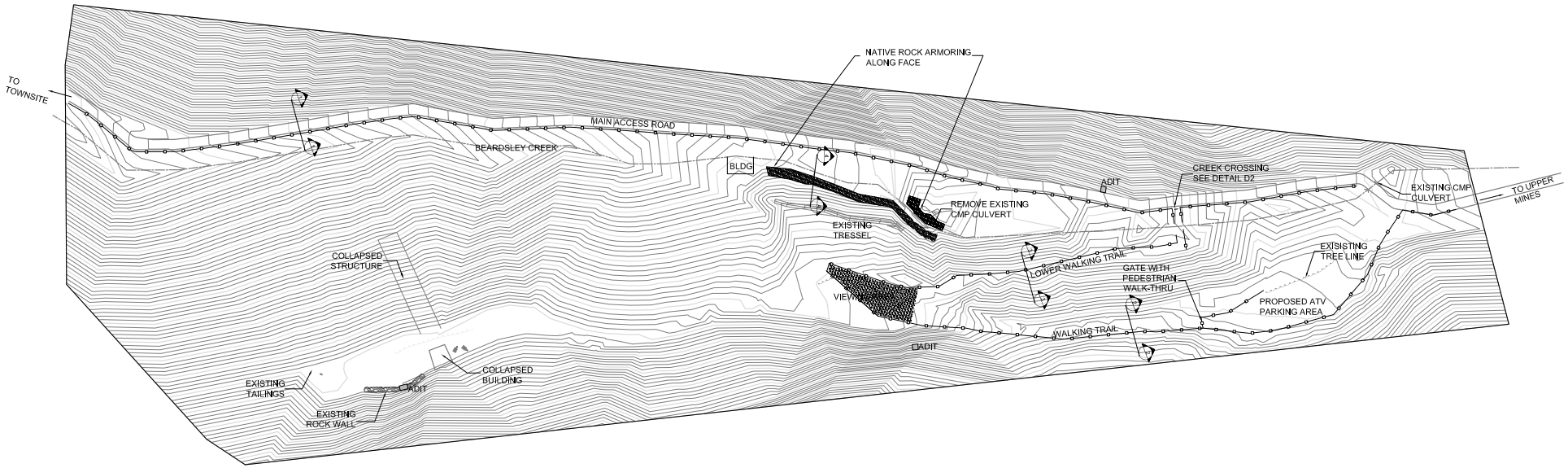
1. POST-AND-POLE FENCE. INSTALL APPROXIMATELY 4 FEET FROM CENTERLINE OF EXISTING TRAIL ON DOWNHILL SIDE ALONG TOP OF SLOPE

3 TYPICAL FENCE PLACEMENT ON LOWER ACCESS TRAIL
NTS



1. GEOTEXTILE
2. 6" SAND LAYER
3. EXISTING TOE OF SLOPE
4. INSTALL ..." ... RIPRAP

4 TYPICAL RIPRAP PLACEMENT ALONG TAILINGS PILE
NTS



NO.	DATE	REVISIONS	BY	CHK

DRAWN: J. GANO | PROJECT NO.: 06208
ENGINEER: D. FORSETH | SCALE: 1" =50'
CHECKED: | APPROVED:
DATE: | DATE:

TerraGraphics
Environmental Engineering, Inc.

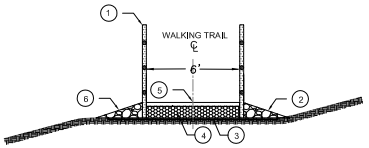
STATE OF IDAHO
PARKS AND RECREATION

PROFESSIONAL ENGINEER REGISTERED 12175 STATE OF IDAHO BRIAN FORSETH

BAYHORSE TOWNSITE
BEARDSLEY AND
PACIFIC MINE SITE
PROJECT #360562

BEARDSLEY-EXELSIOR MINE

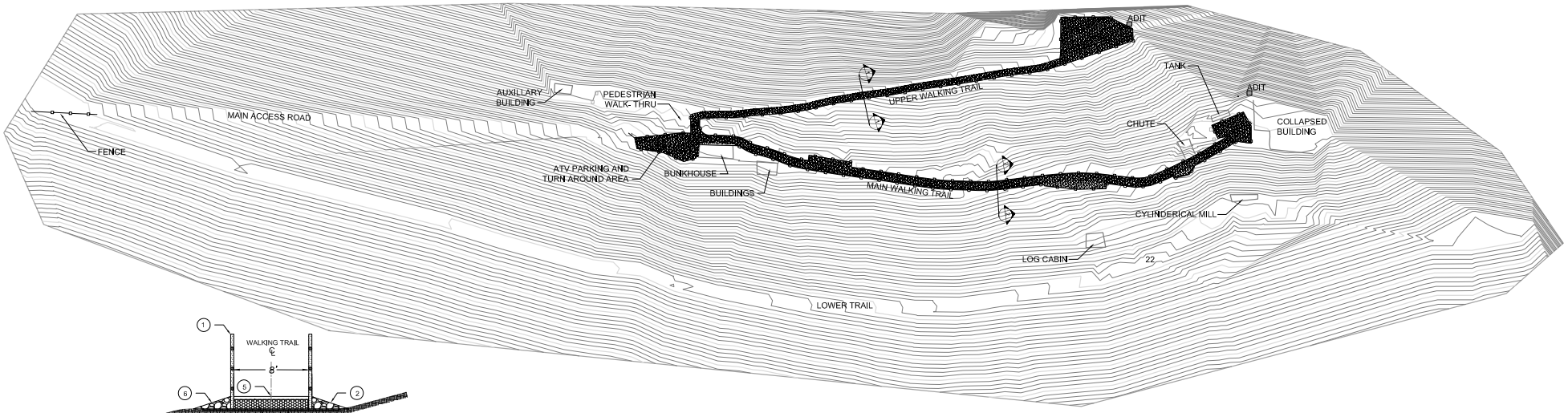
SHEET INDEX # C4
DATE: 2/6/2008
SHEET: 8 OF 17



1. THREE RAIL POST-AND-POLE FENCE.INSTALL ON DOWNHILL SIDE OF TRAIL
2: ROCK SHOULDER
3: GEOTEXTILE
4. GEOWEB
5. TRAIL COVER MATERIAL
6. TAPER SHOULDER 2:1 MINIMUM

1 — TYPICAL TRAIL SECTION ALONG UPPER WALKING TRAIL

NTS



1. THREE RAIL POST-AND-POLE FENCE.
2: ROCK SHOULDER
3: GEOTEXTILE
4. GEOWEB
5. TRAIL COVER MATERIAL
6. TAPER SHOULDER 2:1 MINIMUM

2 — TYPICAL TRAIL SECTION ALONG MAIN WALKING TRAIL

NTS

NO.	DATE	REVISIONS	BY	CHK

DRAWN: JAKE GANO | PROJECT NO.: 06208
ENGINEER: D. FORSETH | SCALE: 1" = 50'
CHECKED: | APPROVED:
DATE: | DATE:

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Environmental Engineering, Inc.

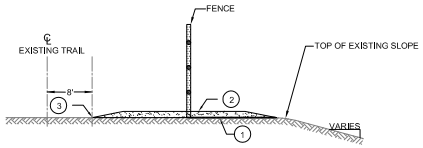
STATE OF IDAHO
PARKS AND RECREATION

PROFESSIONAL ENGINEER REGISTERED 12175 STATE OF IDAHO DEREK FORSETH

BAYHORSE TOWNSITE
BEARDSLEY AND
PACIFIC MINE SITE
PROJECT #360562

PACIFIC MINE

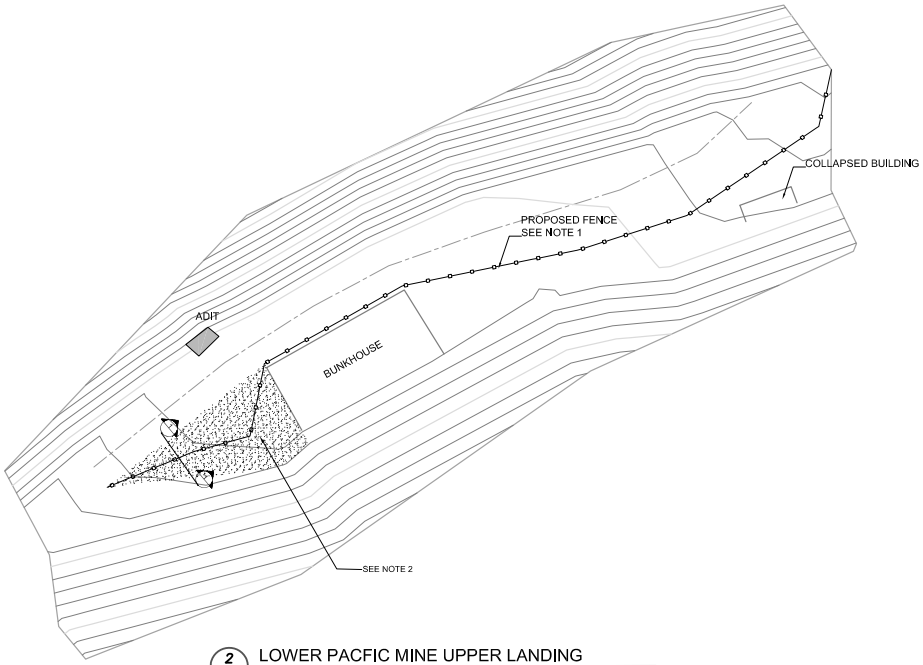
SHEET INDEX # C5
DATE: 2/6/2008
SHEET: 9 OF 17



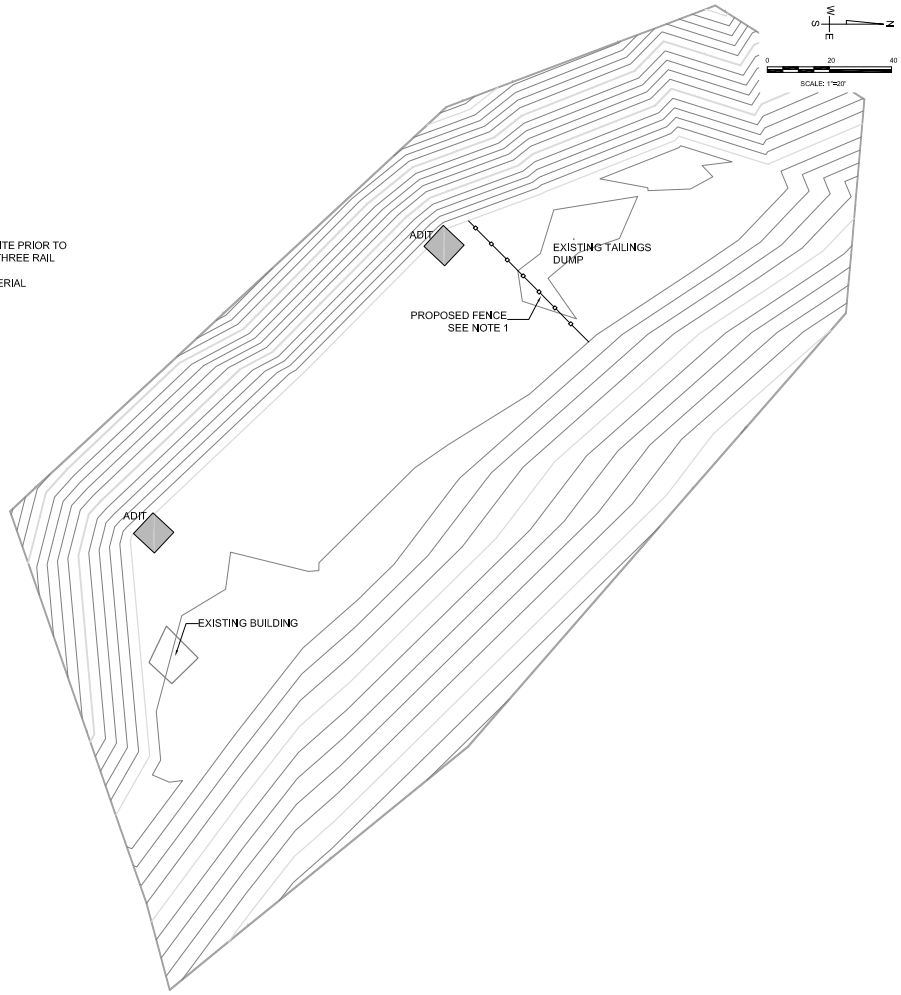
1. GEOTEXTILE. END GEOTEXTILE AT FENCE LINE
2. 6" THICK TRAIL COVER MATERIAL
3. TAPER SHOULDER MATERIAL AT 1V:5H MAX

1 — COVER PLACEMENT
NTS

NOTES
1. OWNER WILL STAKE FENCE ALIGNMENT AT UPPER LANDING SITE PRIOR TO CONSTRUCTION. CONTRACTOR WILL FURNISH AND INSTALL THREE RAIL FENCE ACCORDING TO SPECIFICATIONS
2. INSTALL FENCE POSTS PRIOR TO PLACEMENT OF COVER MATERIAL



2 — LOWER PACFIC MINE UPPER LANDING



3 — LOWER PACFIC MINE LOWER LANDING

NO.	DATE	REVISIONS	BY	CHK

DRAWN: JAKE GANO
ENGINEER: D. FORSETH
CHECKED:
DATE:
PROJECT NO.: 06208
SCALE: 1" = 20'
APPROVED:
DATE:

TerraGraphics
Environmental Engineering, Inc.

STATE OF IDAHO
PARKS AND RECREATION

PROFESSIONAL ENGINEER REGISTERED 12175 STATE OF IDAHO BRIAN FORSETH

BAYHORSE TOWNSITE
BEARDSLEY AND
PACIFIC MINE SITE
PROJECT #360562

LOWER PACIFIC MINE
UPPER AND LOWER
LANDINGS

SHEET INDEX # C6
DATE: 2/6/2008
SHEET: 10 OF 17